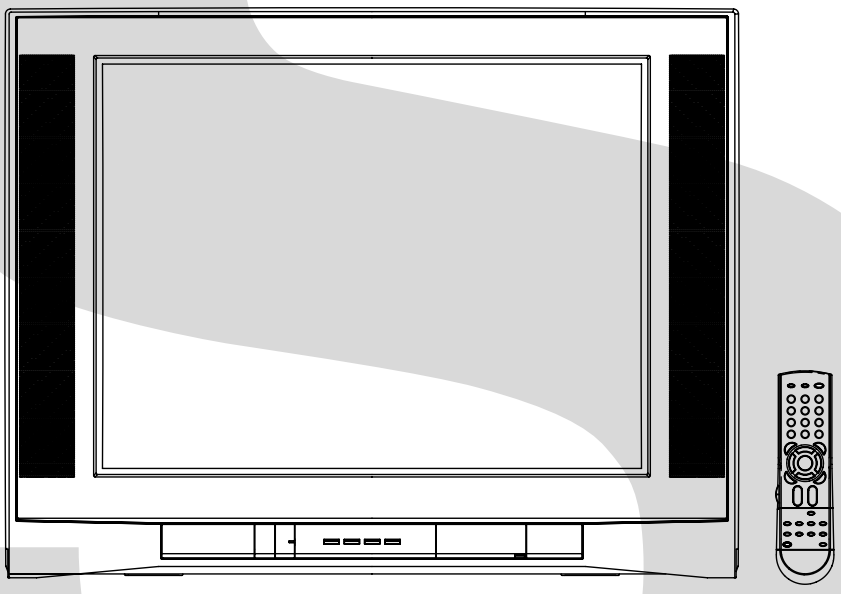
TOSHIBA

FILE NO. 050-200314

SERVICE MANUAL

COLOR TELEVISION

27AF53



DOCUMENT CREATED IN JAPAN, May, 2003

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.
When replacing an IC's or transistors, use only specified silicon grease (YG6260M).
Remove all old silicon before applying new silicon.

TABLE OF CONTENTS

GENERAL SPECIFICATIONS

G-1	**TV System**	CRT	CRT Size / Visual Size	27 inch / 676.6mmV
			CRT Type	Flat
			Deflection	104 degree
			Magnetic Field BV/BH	+0.45G/0.18G
		Color System		NTSC
		Speaker		2 Speaker
			Position	Front Side
			Size	1.8 x 3.9 Inch
			Impedance	8 ohm
		Sound Output	MAX	5.0+5.0 W
			10%(Typical)	4.0+4.0 W
		NTSC3.58+4.43 /PAL60Hz		No
G-2	**Tuning System**	Broadcasting System		US System M
		Tuner and Receive CH	System	1Tuner
			Destination	USA(W/ CATV)
			Tuning System	F-Synth
			Input Impedance	VHF/UHF 75 ohm
			CH Coverage	2 - 69, 4A, A-5 - A-1, A - I, J - W, W+1 - W+84
		Intermediate Frequency	Picture(FP)	45.75MHz
			Sound(FS)	41.25MHz
			FP-FS	4.50MHz
		Preset CH		No
		Stereo/Dual TV Sound		Yes
		Tuner Sound Muting		Yes
G-3	**Power**	Power Source	AC	120V AC 60Hz
			DC	
		Power Consumption	at AC	
				135 W at AC 120 V 60 Hz
			Stand by (at AC)	3 W at AC 120 V 60 Hz
			Per Year	-- kWh/Year
		Protector	Power Fuse	Yes
G-4	**Regulation**		Safety	UL/CSA
			Radiation	FCC/IC
			X-Radiation	DHHS/HWC
G-5	**Temperature**		Operation	+5oC ~ +40oC
			Storage	-20oC ~ +60oC
G-6	**Operating Humidity**			Less than 80% RH

GENERAL SPECIFICATIONS

G-7	**On Screen Display**	Menu			Yes
			Menu Type		Icon
			Picture		Yes
				Contrast	Yes
				Brightness	Yes
				Color	Yes
				Tint	Yes
				Sharpness	Yes
				Reset	Yes
			Sound		Yes
				Bass	Yes
				Treble	Yes
				Balance	Yes
				MTS	Yes
				BBE On/Off	Yes
				Stable Sound On/Off	Yes
				Surround On/Off	Yes
			Set Up		Yes
				Closed Caption	Yes
				PIP Source	No
				TV/CATV	Yes
				Auto CH Memory	Yes
				Add/ Delete	Yes
			Mode		Yes
				Color Temperature	Yes
				Picture Preference	Yes
			Option		Yes
				Language	Yes
				CH Label	Yes
				Favorite CH	Yes
				V-Chip	Yes
				Lock	Yes
				On/Off Timer	Yes
				Color Stream DVD/DTV	Yes
				Image Tilt	Yes
			Control Level		Yes
				Volume	Yes
				Brightness	Yes
				Contrast	Yes
				Color	Yes
				Tint	Yes
				Sharpness	Yes
				Tuning	No
				Bass	Yes
				Treble	Yes
				Balance	Yes
				Image Tilt	Yes
			Stereo,Audio Output,SAP		Yes
			Video		Yes
			Color Stream		Yes
			Channel(TV/Cable)		Yes
			CH Label		Yes
			Game Timer		Yes
			Sleep Timer		Yes
			Sound Mute		Yes
			V-chip Rating		Yes
			16: 9		Yes
G-8	**OSD Language**				English French Spanish
G-9	**Clock and Timer**	Sleep Timer		Max Time	120 Min
				Step	10 Min
		On/Off Timer		Program(On Timer / Off Timer)	Yes
		Wake Up Timer			No
		Timer Back-up (at Power Off Mode)		more than	-- Min Sec

GENERAL SPECIFICATIONS

G-10	**Remote Control**	Unit		RC-GR
		Glow in Dark Remocon		No
		Back Light Remocon		Yes
		Format		Toshiba
		Custom Code		TV:40-BFh
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-3 x 2 pcs
		Total Keys		40 Keys
		Keys	Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			100 /+10	Yes
			CH Up	Yes
			CH Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			TV/Video(Input Select)	Yes
			ENT,CH RTN(Quick View)	Yes
			Menu > / FAV Up	Yes
			Menu < / FAV Down	Yes
			Menu Up	Yes
			Menu Down	Yes
			Mute	Yes
			PIC SIZE (16:9)	Yes
			Light	Yes
		Multi Brand Keys	TV/CBL/SAT/VCR/DVD	Yes
		(DVD Keys)	Enter	Yes
		(TV / DVD Keys)	SLEEP/TOP MENU	Yes
			RECALL(Call) / (Display)	Yes
			Menu/Enter / DVD MENU	Yes
			Exit / DVD CLEAR	Yes
		(DVD / VCR Keys)	Pause/Still	Yes
			FF	Yes
			Rew	Yes
			Play	Yes
			Stop	Yes
			<</Skip / Search Forward	Yes
			>>/Skip / Search Forward	Yes
		(VCR Keys)	Rec	Yes
			TV/VCR	Yes

GENERAL SPECIFICATIONS

G-11	**Features**	Auto Degauss		Yes
		Auto Shut Off		Yes
		Canal+		No
		CATV		Yes
		Anti-theft		No
		Rental		No
		Memory(Last CH)		Yes
		Memory(Last Volume)		Yes
		V-Chip		Yes
			Type	USA,Toshiba Type
		BBE		Yes
		Auto Search		No
		CH Allocation		No
		SAP		Yes
		Just Clock Function		No
		CH Label		Yes
		VM Circuit		Yes
		Full OSD		No
		Premiere		No
		Comb Filter		Yes 3 -D
		Vertical Contour Correction		Yes
		Auto CH Memory		Yes
		Hotel Lock		No
		Closed Caption		Yes
		Stable Sound		Yes
		FBT Leak Test Protect		Yes
		CH Lock		Yes
		Video Lock		Yes
		Game Timer (Max Time:120 Min)		Yes
		Energy Star		Yes
		Favorite CH		Yes
		Surround		Yes
		16:9 Mode		Yes
		Color Temparature Control		Yes
		Picture Preference		Yes
		Tilt Correction		Yes
		2 Tuner P-in-P		No
G-12	**Accessories**	Owner's Manual	Language	English / French
			W/ Warranty	Yes
		Remote Control Unit		Yes
		Rod Antenna		No
			Poles	
			Terminal	
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Station List		No
		Important Safety Instruction		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		Quick Set-up Sheet		No
		Battery		Yes
			UM size x pcs	UM-3 x 2
			OEM Brand	No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card (NDL Card)		Yes
		PTB Sheet		No
		ESP Card		Yes
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS

G-13	**Interface**	Switch	Front	Power	Yes
				System Select	No
				Main Power SW	No
				Sub Power	No
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
			Rear	AC/DC	No
				TV/CATV Selector	No
				Degauss	No
				Main Power SW	No
		Indicator		Power	Yes(RED)
				Stand-by	No
				On Timer	No
		Terminals	Front	Video Input = VIDEO3	RCA
				Audio Input = VIDEO3	RCA x 2
				S Input	Yes
				Other Terminal	Head Phone
			Rear	Video Input(Rear1) = VIDEO1	RCA
				Video Input(Rear2) = VIDEO2	RCA
				Audio Input(Rear1) = VIDEO1	RCA x 2
				Audio Input(Rear2) = VIDEO2	RCA x 2
				Video Output	RCA
				Audio Output	RCA x 2
				Euro Scart	No
				Color Stream	RCA x 3
				S Input	Yes
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	No
				VHF/UHF Antenna Input	F Type
				AC Outlet	No
G-14	**Set Size**			Approx. W x D x H (mm)	740 x 495 x 574.5
G-15	**Weight**			Net (Approx.)	40.0 kg (88.2 lbs)
				Gross (Approx.)	46.5kg (102.5lbs)
G-16	**Carton**		Master Carton		No
				Content	---- Sets
				Material	-- /--
				Dimensions W x D x H(mm)	-- x -- x --
				Description of Origin	No
			Gift Box		Yes
				Material	Double/Brown
				Dimensions W x D x H(mm)	850 x 620 x 665
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test		Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	31
			Container Stuffing		156 Sets/40' container
G-17	**Cabinet Material**		Cabinet	Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM
			PCB	Non-Halogen Demand	No
				Eyelet Demand	Yes

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 1-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

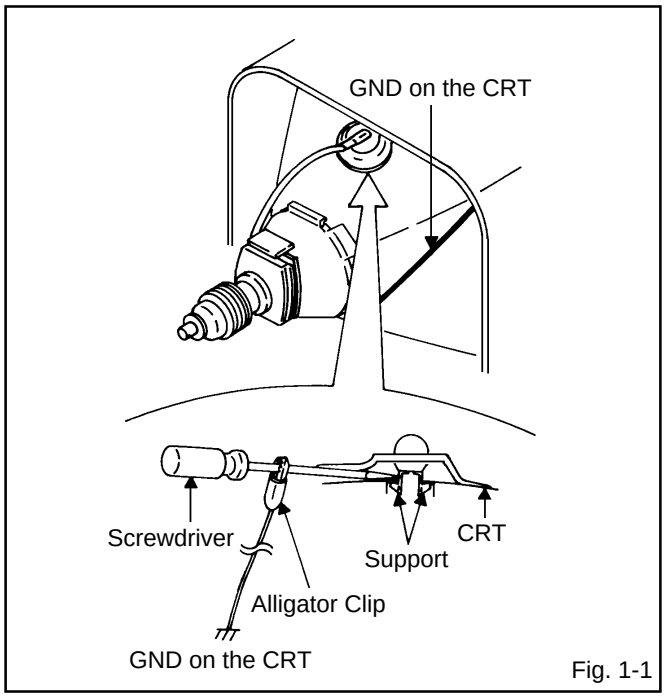


Fig. 1-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 1-2.)**

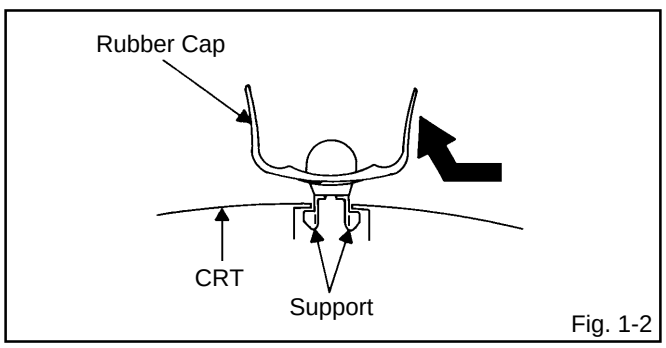


Fig. 1-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 1-3.)**

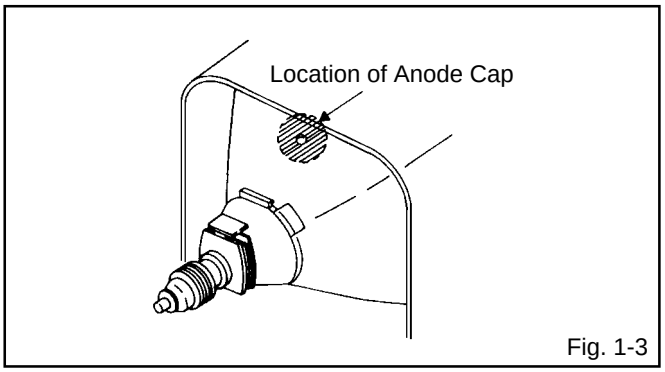


Fig. 1-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 1-4.)**

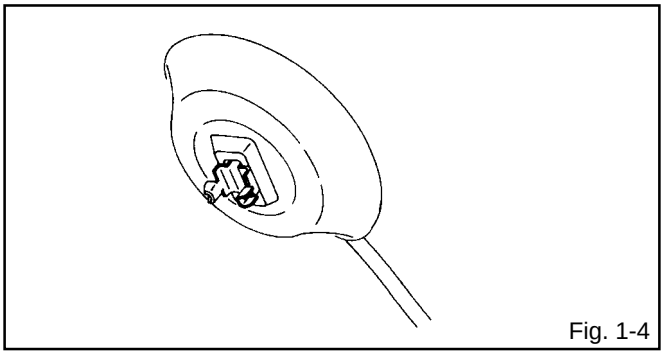


Fig. 1-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 1-5**.

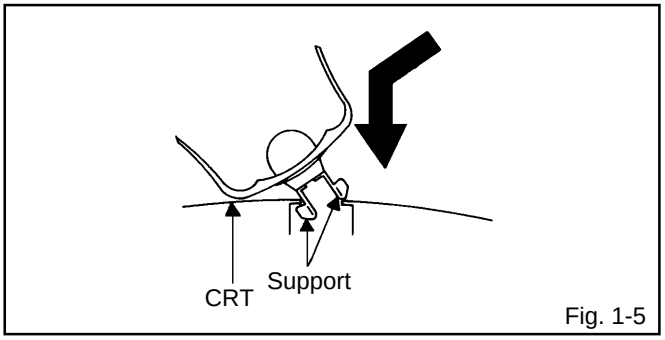


Fig. 1-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

2. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 2-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

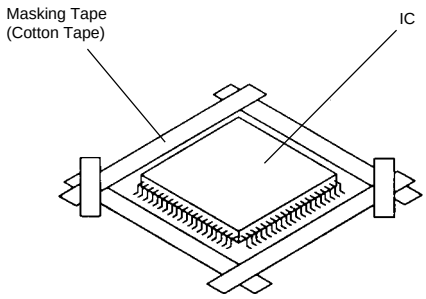


Fig. 2-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 2-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

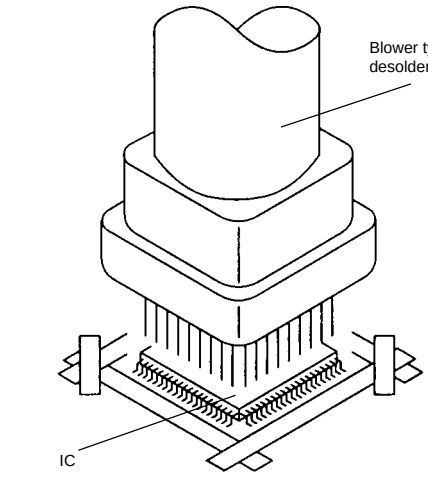


Fig. 2-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 2-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

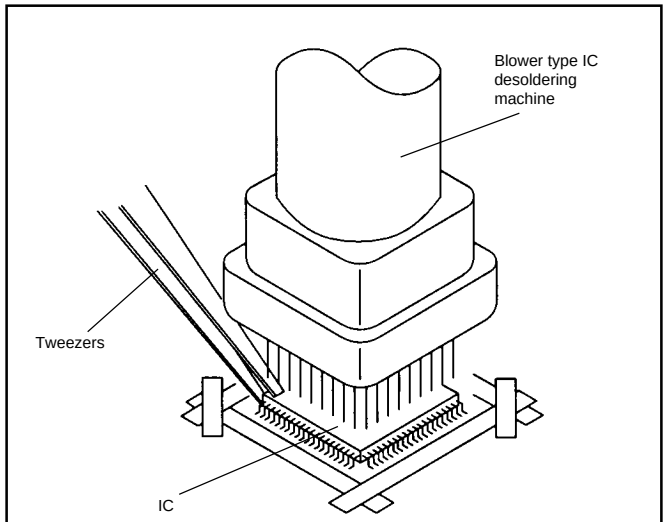


Fig. 2-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 2-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

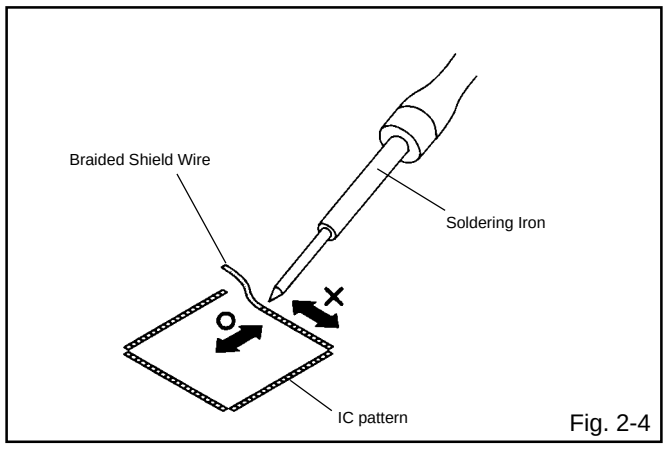


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 2-5.)**

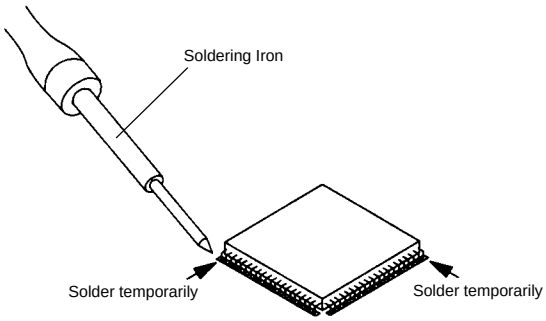


Fig. 2-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 2-6.)**

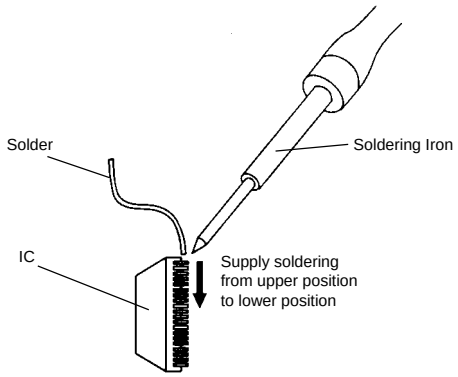


Fig. 2-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 2-7.)**

   NOTE

   Do not absorb the solder to excess.

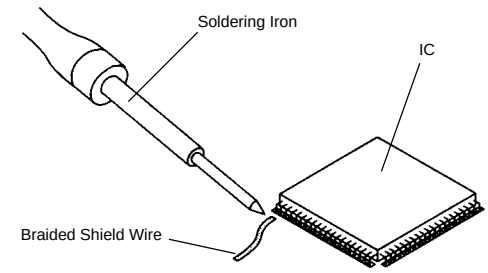


Fig. 2-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 2-8.)**

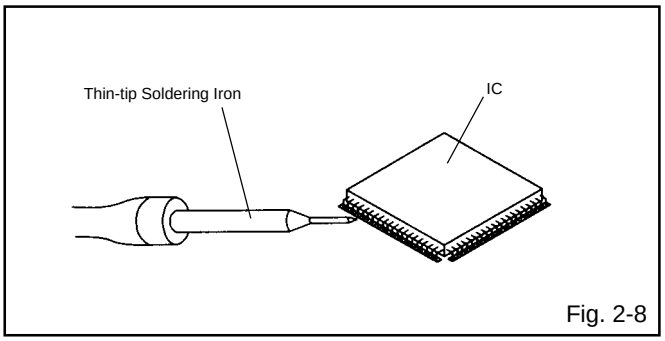


Fig. 2-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   NOTE

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter the Service Mode, press both set key and remote control key for more than 1 second.

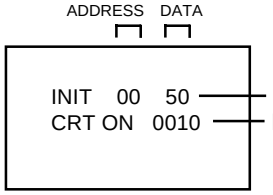
Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD and LOCK PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the channel setting, and the POWER ON total hours.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF HOURS USED". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

CONFIRMATION OF HOURS USED

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.



Initial setting content of MEMORY IC.
POWER ON total hours.
= (16 x 16 x 16 x thousands digit value)
+ (16 x 16 x hundreds digit value)
+ (16 x tens digit value)
+ (ones digit value)

FIG. 1

WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: No need setting for after INI 1F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	50	E8	08	A5	5C	B3	34	77	3D	AC	AA	25	30	30	30	0A
10	0A	00	00	00	00	00	08	00	80	00	80	C0	A4	88	35	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second. ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the VOL. UP/DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. UP/DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input. **After the data input, set to the initializing of shipping.**
9. Turn POWER on.
10. Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 1 second.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 1 second to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

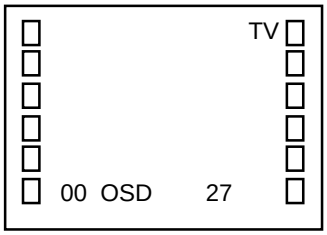


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION	NO.	FUNCTION
00	OSD H	16	BRIGHT CENT	31	E/W CORNER
01	CUT OFF	17	BRIGHT MIN	32	E/W TRAPEZIUM
02	H. VCO	18	CONTRAST MAX	33	LEVEL
03	H. PHASE	19	CONTRAST CENT	34	SEPARATION1
05	V. SHIFT	20	CONTRAST MIN	35	SEPARATION2
06	H. SIZE	21	COLOR MAX	51	DRIVE R COOL
07	V. SIZE	22	COLOR CENTER	52	DRIVE B COOL
08	V. LINEARITY	23	COLOR MIN	53	R BIAS COOL
09	VS CORRECTION	24	TINT	54	G BIAS COOL
10	DRIVE R MEDIUM	25	SHARPNESS	55	B BIAS COOL
11	DRIVE B MEDIUM	26	Cb DELAY FINE	56	DRIVE R WARM
12	R BIAS MEDIUM	27	Cr DELAY FINE	57	DRIVE B WARM
13	G BIAS MEDIUM	28	Cb PEDESTAL ADJ	58	R BIAS WARM
14	B BIAS MEDIUM	29	Cr PEDESTAL ADJ	59	G BIAS WARM
15	BRIGHT MAX	30	E/W PARABOLA	60	B BIAS WARM

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Place the set with Aging Test for more than 5 minutes.
2. Set condition is AV MODE without signal.
3. Connect the digital voltmeter to the **TP003**.
4. Adjust the **VR502** until the digital voltmeter is 135 ± 1V.

2-2: CUT OFF

1. Place the set with Aging Test for more than 15 minutes.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
3. Adjust the **Screen Volume** until a dim raster is obtained.

2-3: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment. The adjustments of MEDIUM mode, COOL mode, WARM mode are needed.

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(12)** on the remote control to select “R. BIAS”.
5. Press the CH. UP/DOWN button on the remote control to select the “R. BIAS”, “G. BIAS”, “B. BIAS”, “B. DRIVE” or “G. DRIVE”.
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R. BIAS, G. BIAS, B. BIAS, B. DRIVE, and G. DRIVE at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

2-4: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select “H. PHAS”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-5: HORIZONTAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select “H. SIZE”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes 11 ± 1%.

ELECTRICAL ADJUSTMENTS

2-6: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.

2-7: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select “V. SIZE”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes 9 ± 2%.

2-8: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-7. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select “V. LIN”.
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-9: LEVEL

1. Receive the VHF HIGH (70dB).
2. Connect the AC voltmeter to **pin 6 of CP101**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "LEVEL".
4. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is 85 ± 2mV.

2-10: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-11: E/W CORNER

1. Receive the crosshatch signal from the Pattern Generator.
2. Set the screen mode to 4:3.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(31)** on the remote control to select “COR TOP”.
5. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.
6. Set the screen mode to 16:9. Then perform the above adjustments 4~5.

2-12: E/W PARABOLA

1. Receive the crosshatch signal from the Pattern Generator.
2. Set the screen mode to 4:3.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(30)** on the remote control to select “PARABOLA”.
5. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.
6. Set the screen mode to 16:9. Then perform the above adjustments 4~5.

2-13: TRAPEZIUM

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(32)** on the remote control to select “TRAPEZIUM”.
4. Press the VOL. UP/DOWN button on the remote control until the both vertical lines of the screen become parallel.

2-14: SEPARATION 1, 2

Please do the method (1) or method (2) adjustment.

Method (1)

1. Set the multi-sound signal generator for each different L-ch and R-ch frequency (Ex. L-ch=2KHz, R-ch=400Hz) and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select “SEP 1”.
4. Press the VOL. UP/DOWN button on the remote control to adjust it until the audio output wave becomes a fine sine wave.
5. Press the CH UP button once the set to "SEP 2" mode. Then perform the above adjustment 4.

Method (2)

1. Set the multi-sound signal generator L-ch=1KHz, R-ch =Non input and receive the RF.
2. Connect the oscilloscope to the **Audio Out Jack (R-ch)**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(34)** on the remote control to select “SEP 1”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the R-ch output becomes minimum.
6. Set the multi-sound signal generator L-ch=Non input, R-ch=1KHz and receive the RF.
7. Connect the oscilloscope to the **Audio Out Jack (L-ch)**.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select “SEP 2”.
9. Press the VOL. UP/DOWN button on the remote control to adjust it until the L-ch output becomes minimum.

ELECTRICAL ADJUSTMENTS

2-15: BRIGHT CENT

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 0% is starting to be visible
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the TV/VIDEO button on the remote control to set to the CS mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control until the brightness step No. becomes “67”.
10. Receive a broadcast and check if the picture is normal.

2-16: TINT/COLOR CENT

1. Receive the color bar pattern.
2. Connect the oscilloscope to **TP806**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(24)** on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes as straight line **(Refer to Fig. 2-1)**
5. Connect the oscilloscope to **TP804**.
6. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "COL.CENT".
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 120 ± 10% of the white level. **(Refer to Fig. 2-2)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.
10. Press the TV/VIDEO button on the remote control to set to the CS mode.
11. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

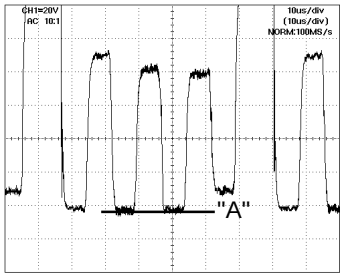


Fig. 2-1

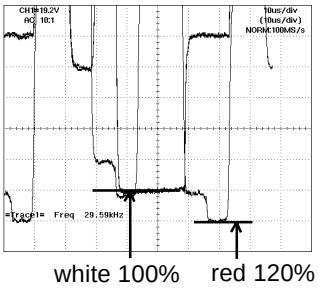


Fig. 2-2

2-17: CONTRAST MAX MANUAL

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select “CONT. MAX”.
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes “61”.
3. Receive a broadcast and check if the picture is normal.
4. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.
5. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 1~3.

2-18: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below. (RF/AV/CS)

NO.	FUNCTION	STEP NO.	NO.	FUNCTION	STEP NO.
00	OSD H	27	21	COL.MAX	80
02	H.VCO	03	23	COL.MIN	00
05	V.SHIFT	02	25	SHARPNESS	40
09	VS.CORRECTION	22	26	CB DL	00
15	BRI.MAX	105	27	CR DL	00
17	BRI.MIN	55	28	CB PED	08
19	CONT.CENT	42	29	CR PED	08
20	CONT.MIN	10			

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

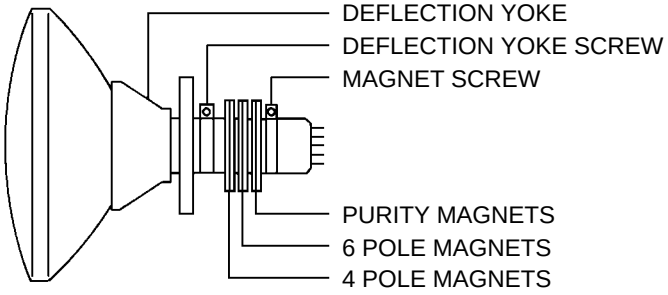


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**

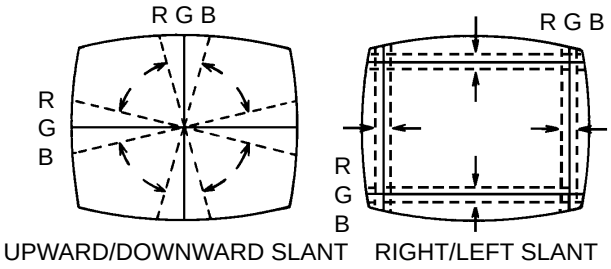
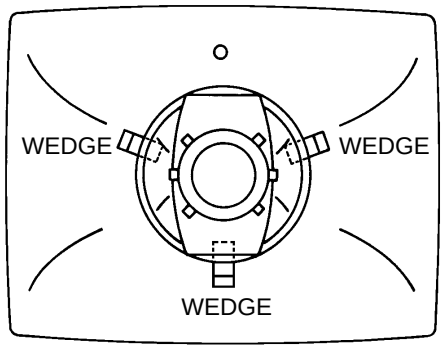


Fig. 3-2-a

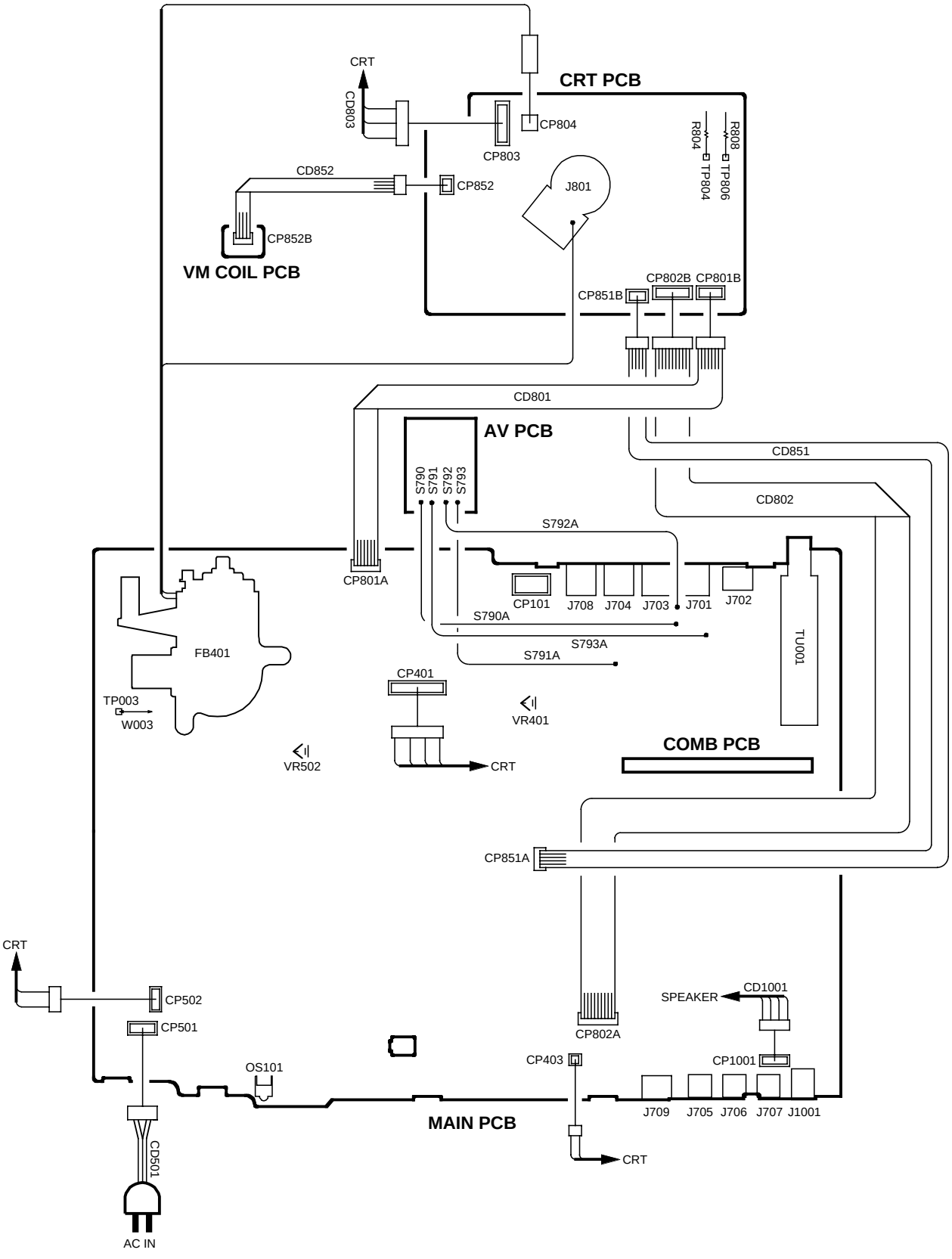


WEDGE POSITION

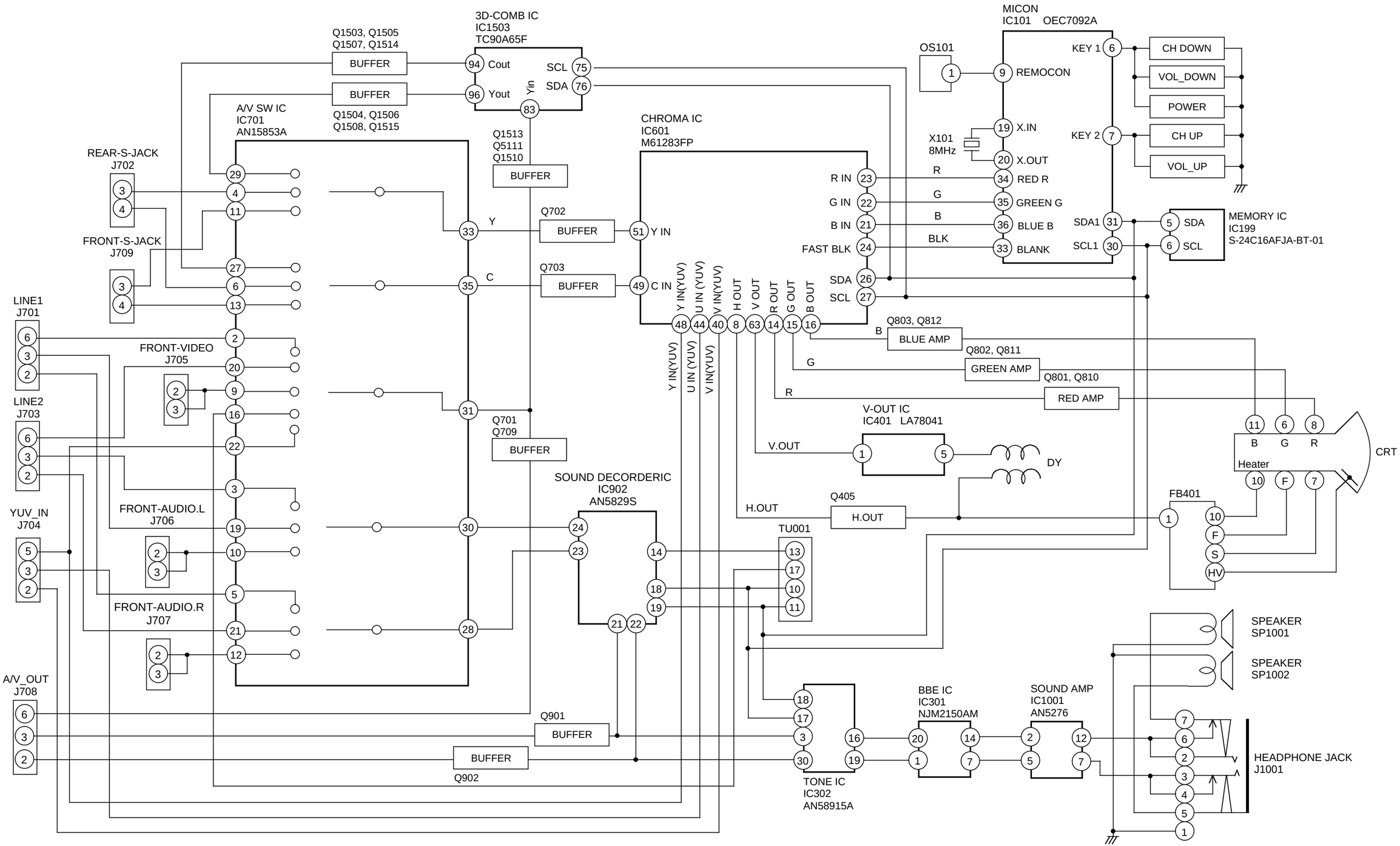
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

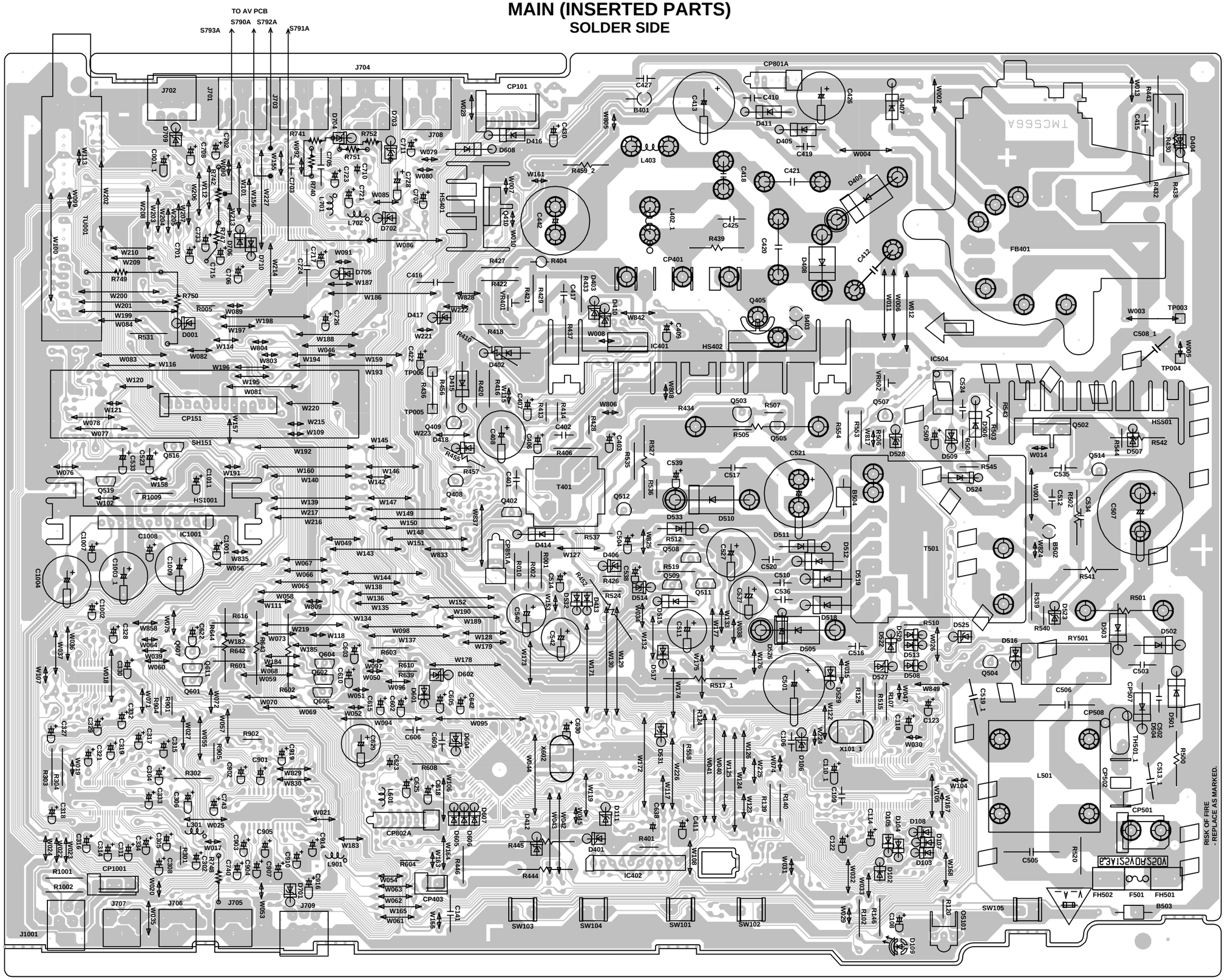
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



BLOCK DIAGRAM



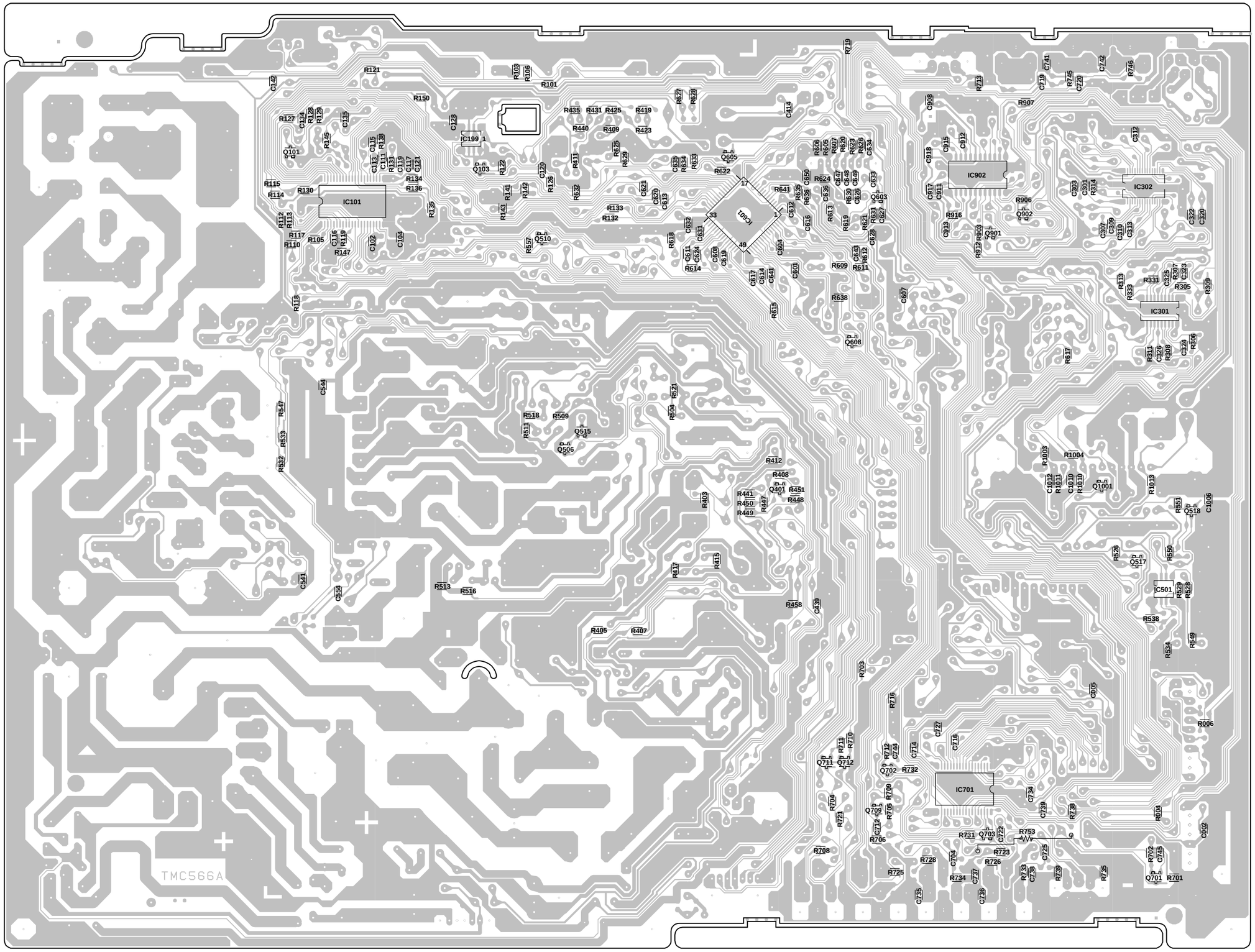
PRINTED CIRCUIT BOARDS
MAIN (INSERTED PARTS)
SOLDER SIDE



F-1

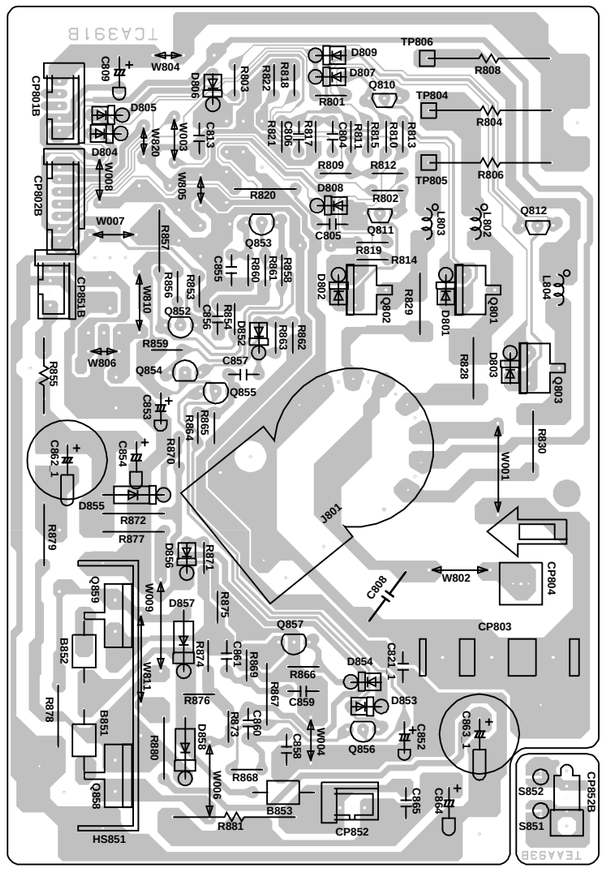
F-2

PRINTED CIRCUIT BOARDS
MAIN (CHIP MOUNTED PARTS)
SOLDER SIDE

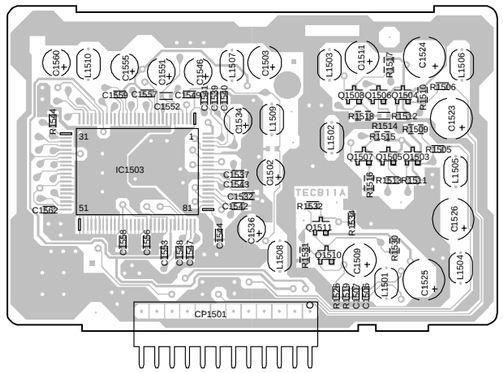


PRINTED CIRCUIT BOARDS

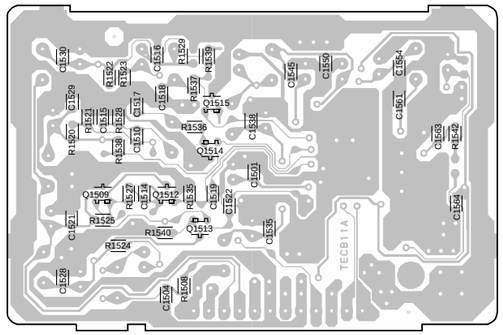
CRT/VM COIL
SOLDER SIDE



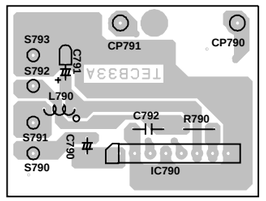
COMB (TOP SIDE)
SOLDER SIDE



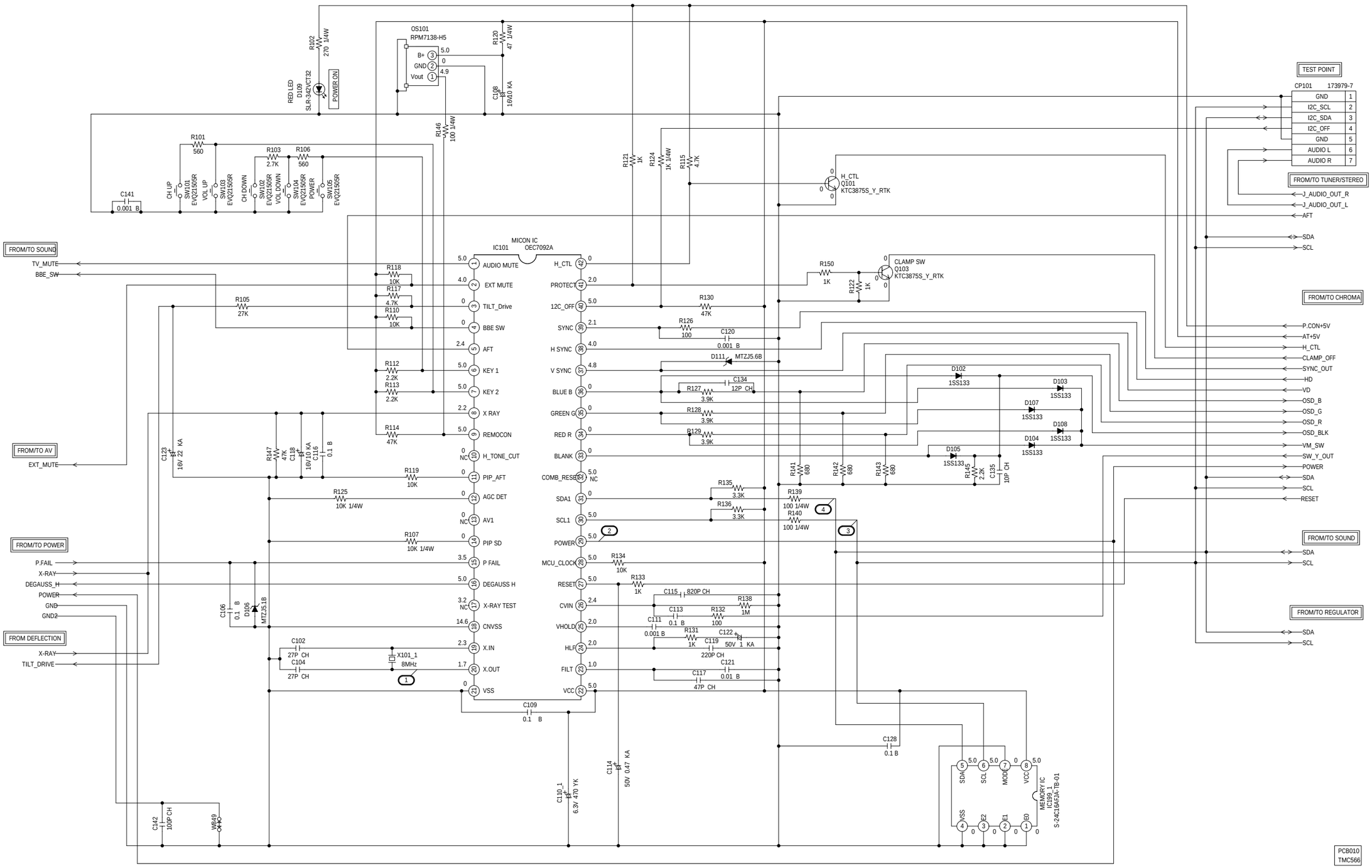
COMB (BOTTOM SIDE)
SOLDER SIDE



AV
SOLDER SIDE



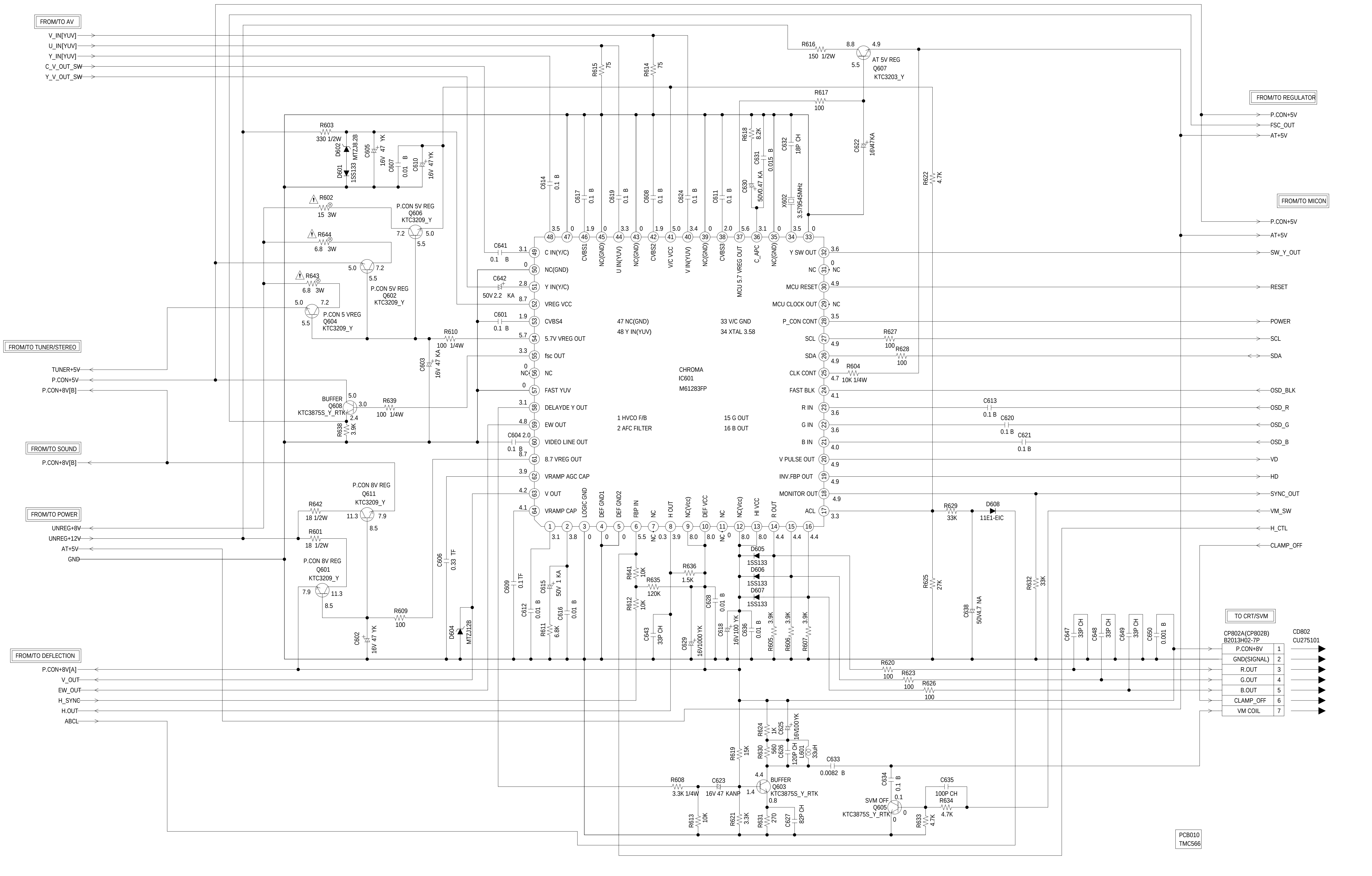
MICON SCHEMATIC DIAGRAM
(MAIN PCB)



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

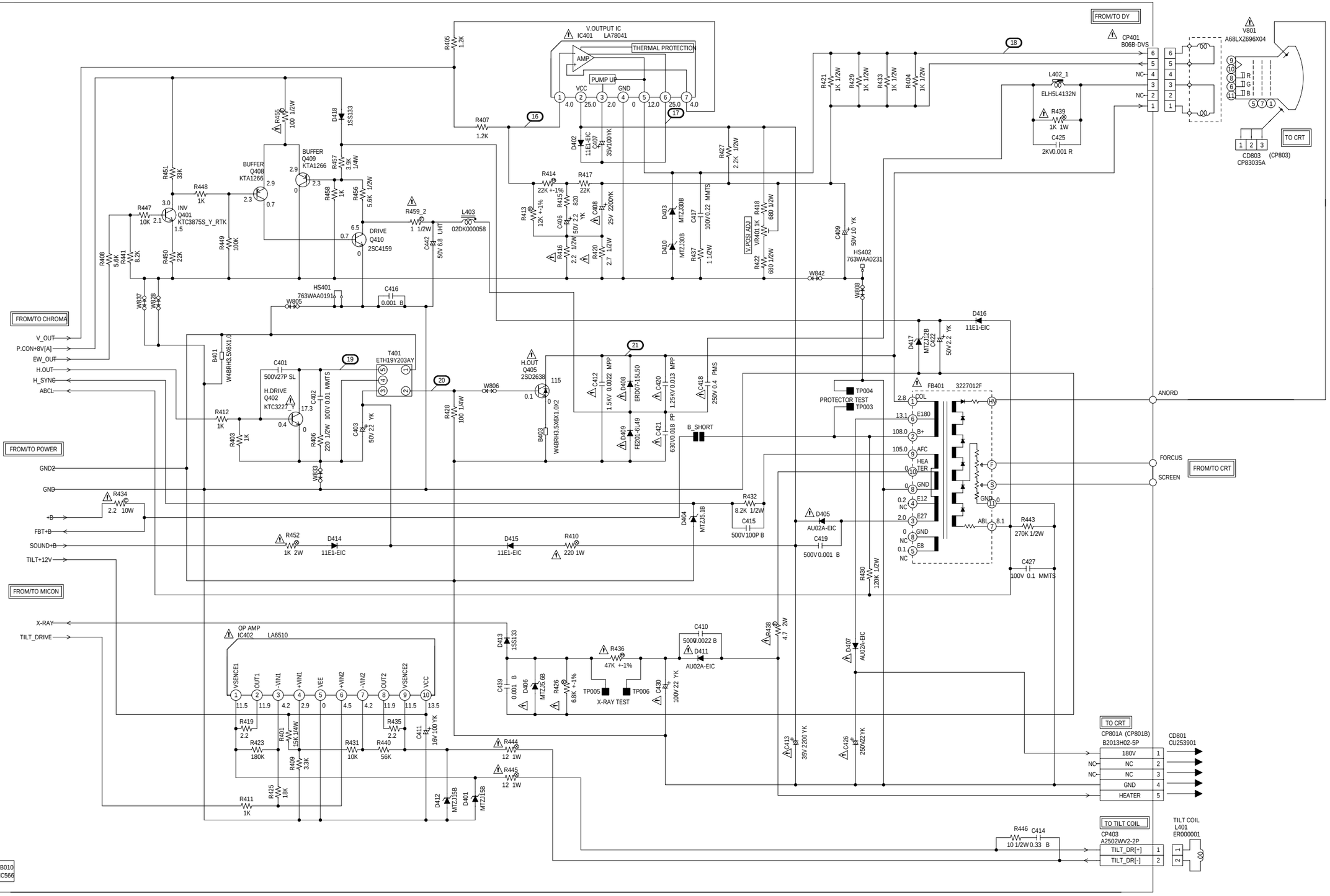
CHROMA SCHEMATIC DIAGRAM (MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

DEFLECTION SCHEMATIC DIAGRAM
(MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

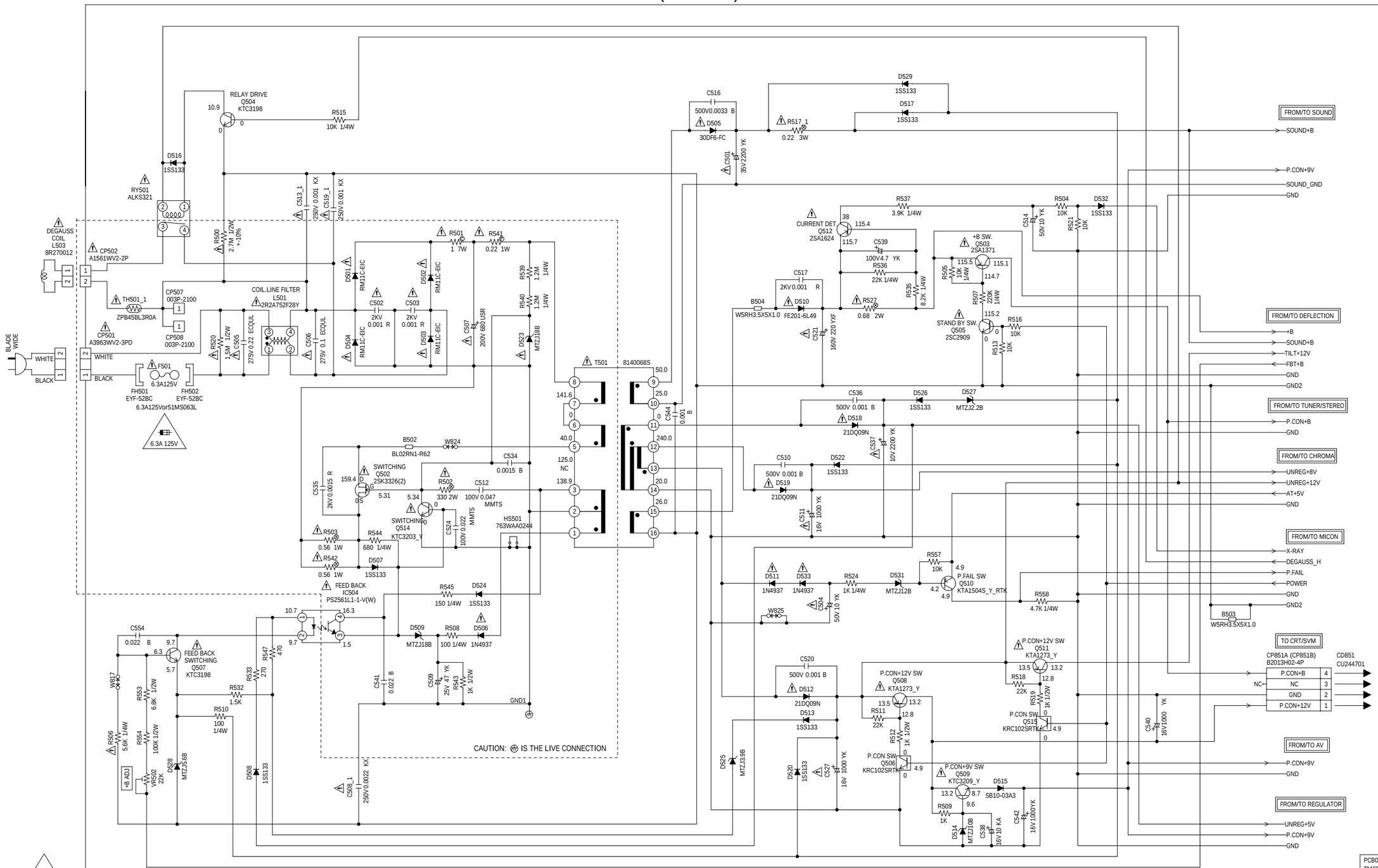
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

POWER SCHEMATIC DIAGRAM
(MAIN PCB)

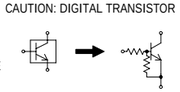


6.3A 125V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 6.3V 125V(F501).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTOLISER QUE DES FUSIBLE DE MEME TYPE 6.3V 125V(F501).

CAUTION: DIGITAL TRANSISTOR



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

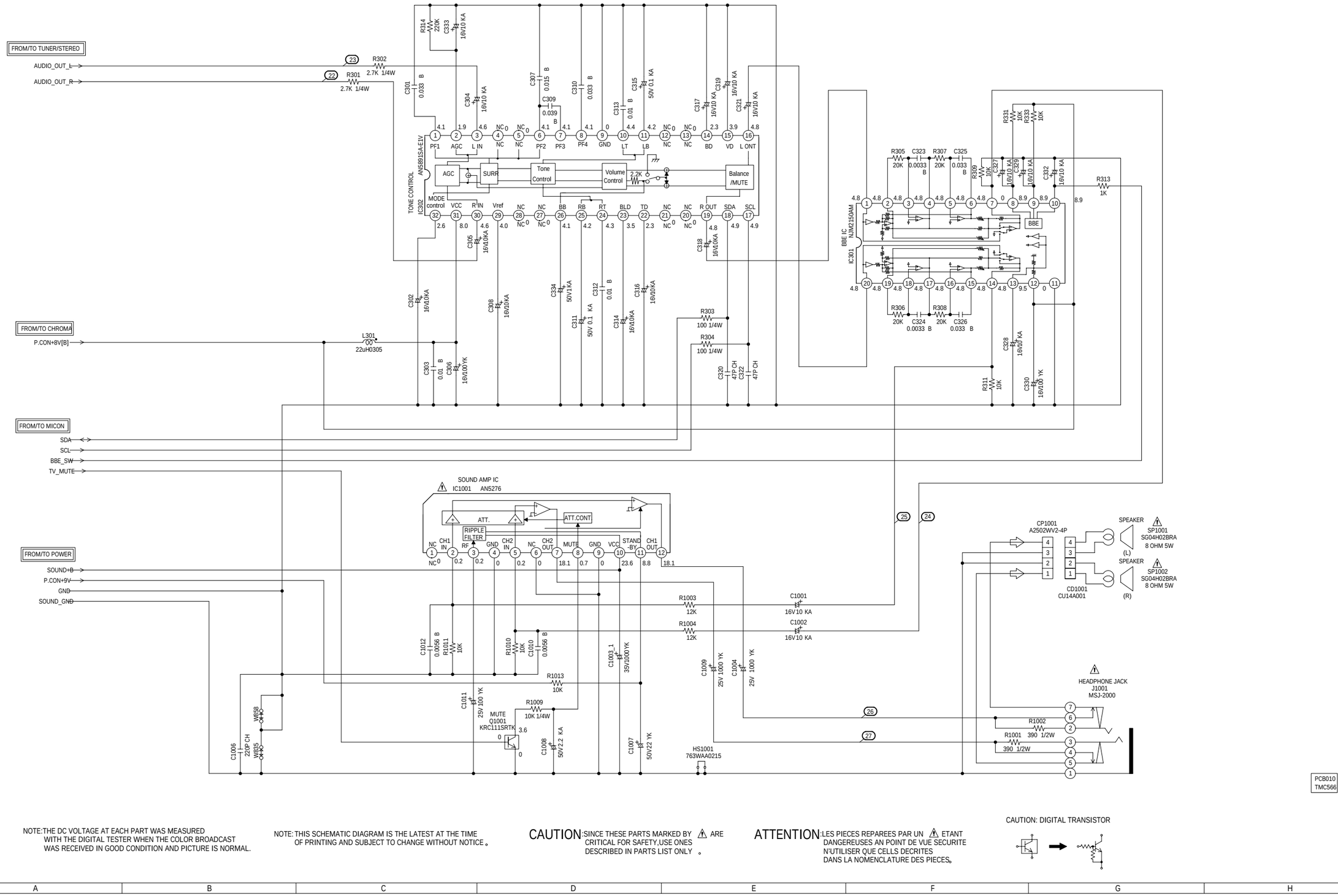
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

SOUND SCHEMATIC DIAGRAM

(MAIN PCB)



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

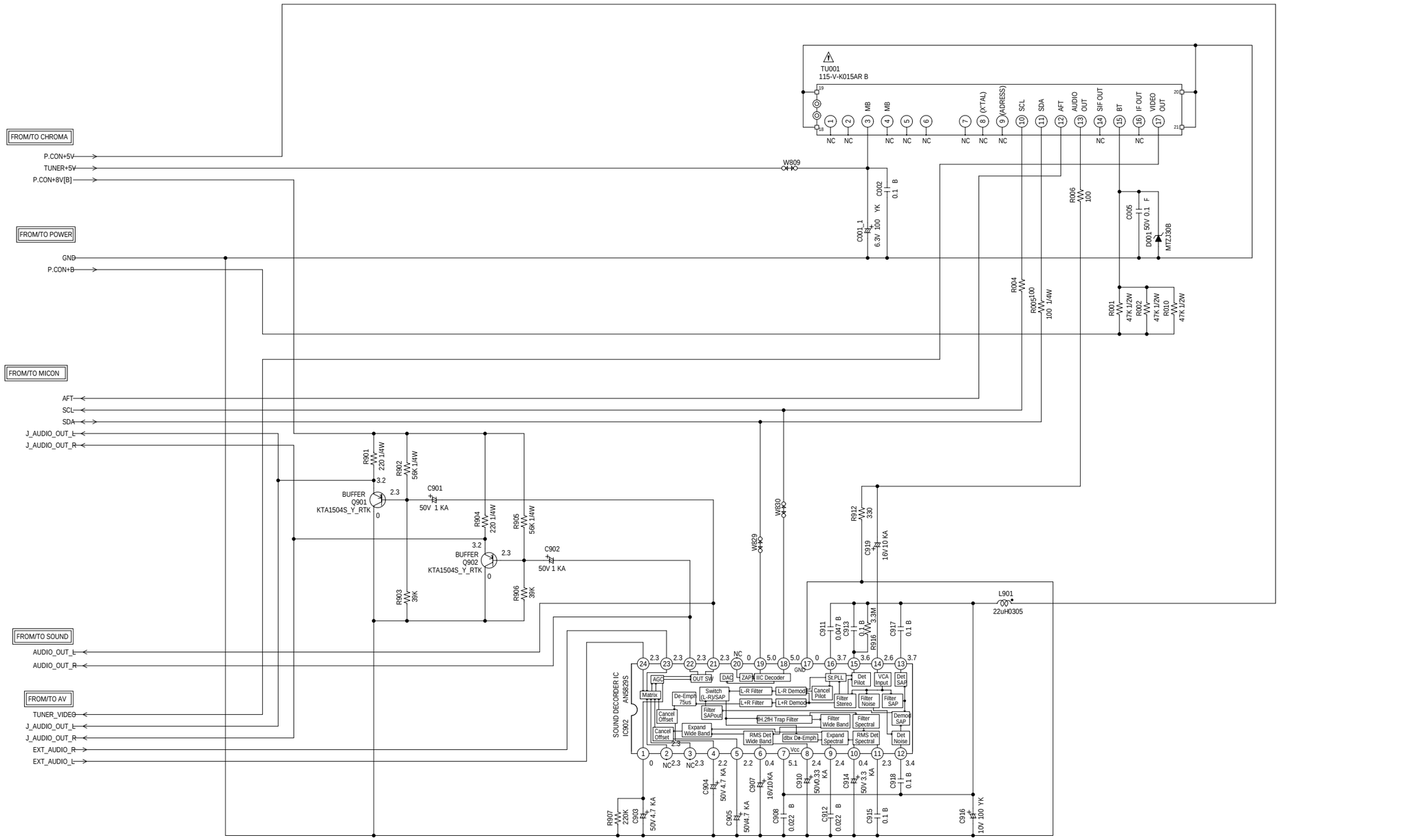
CAUTION:SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION:LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: DIGITAL TRANSISTOR

TUNER/STEREO SCHEMATIC DIAGRAM

(MAIN PCB)



ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

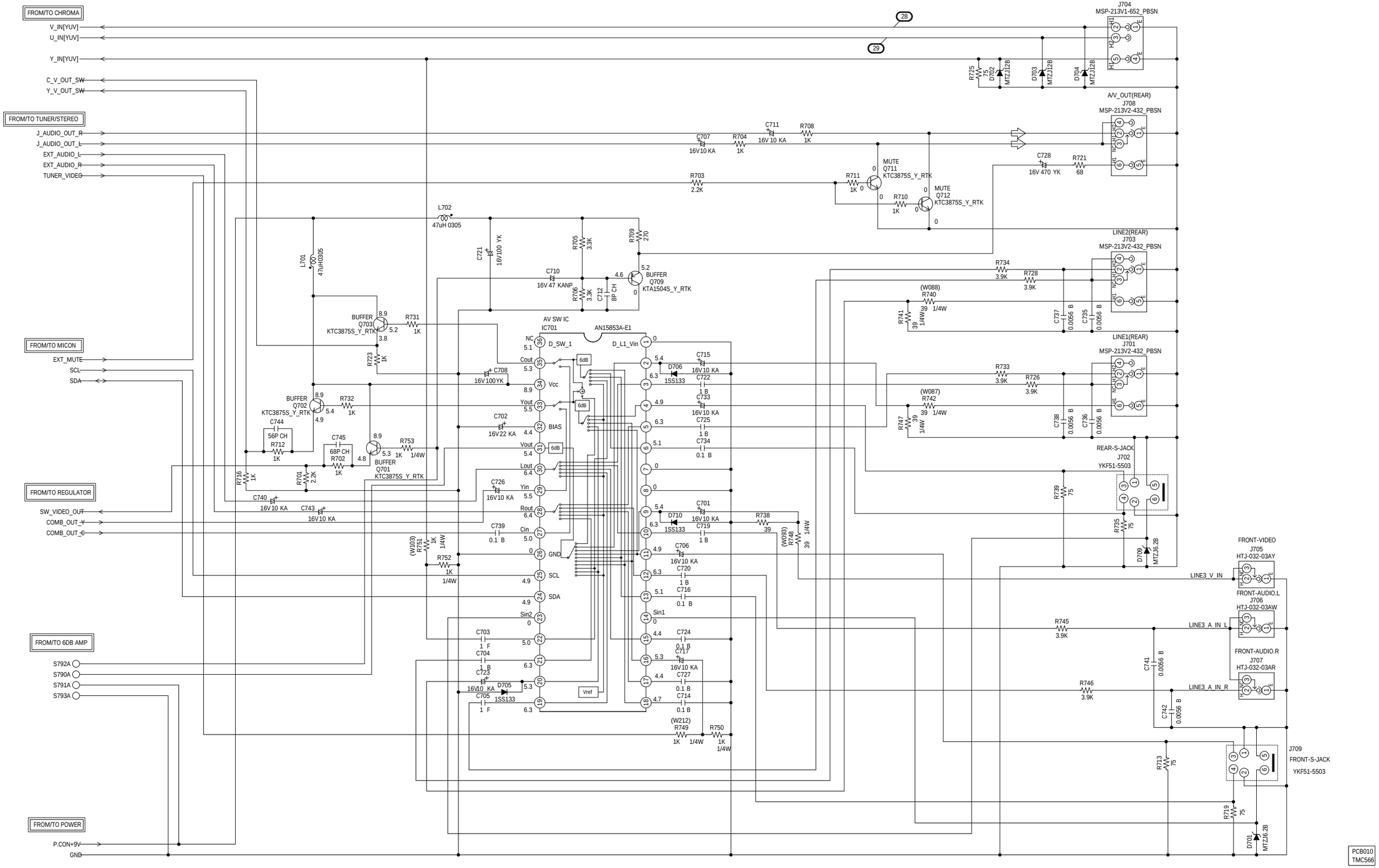
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

AV SCHEMATIC DIAGRAM

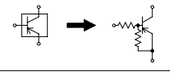
(MAIN PCB)



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

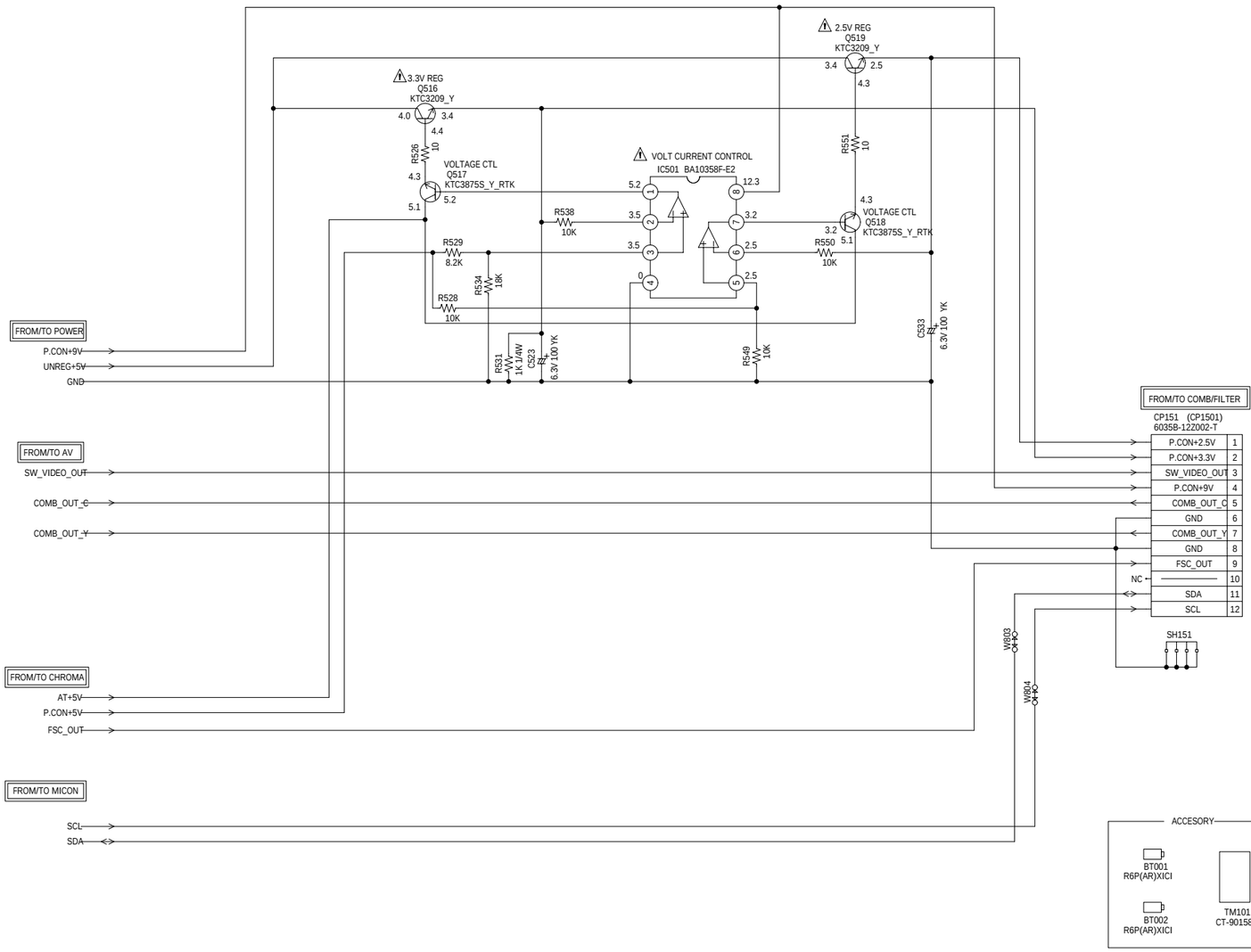
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: DIGITAL TRANSISTOR



REGULATOR SCHEMATIC DIAGRAM

(MAIN PCB)



ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CRT/SVM SCHEMATIC DIAGRAM (CRT PCB)

CRT BLOCK

FROM CHROMA
CP802B (CP802A)
A2001WV2-7P

1	P.CON+8V
2	GND(SIGNAL)
3	R.OUT
4	G.OUT
5	B.OUT
6	CLAMP_OFF
7	VM COIL

FROM DEFLECTION
CP801B (CP801A)
A2001WV2-5P

5	HEATER
4	GND
3	NC
2	NC
1	180V

CP803 (CD803)
A2361WV2-3P

3	GND
2	GND
1	GND

CP804
005P-2100

1	SCREEN

FOCUS

SVM BLOCK

PCB110
TCA391

FROM POWER
CP851B (CP851A)
A2001WV2-4P

4	P.CON+B
3	NC
2	GND
1	P.CON+12V

FROM/TO VM
CP852 (CP852B)
A2001WV2-3P

VM1	1
NC	2
VM2	3

(VM COIL PCB)

PCB060
TEAA93

FROM/TO CRT/SVM
CP852B (CP852)
B2013H02-3P

CD852_1
CU232001

TO VM COIL

S851

S852

NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

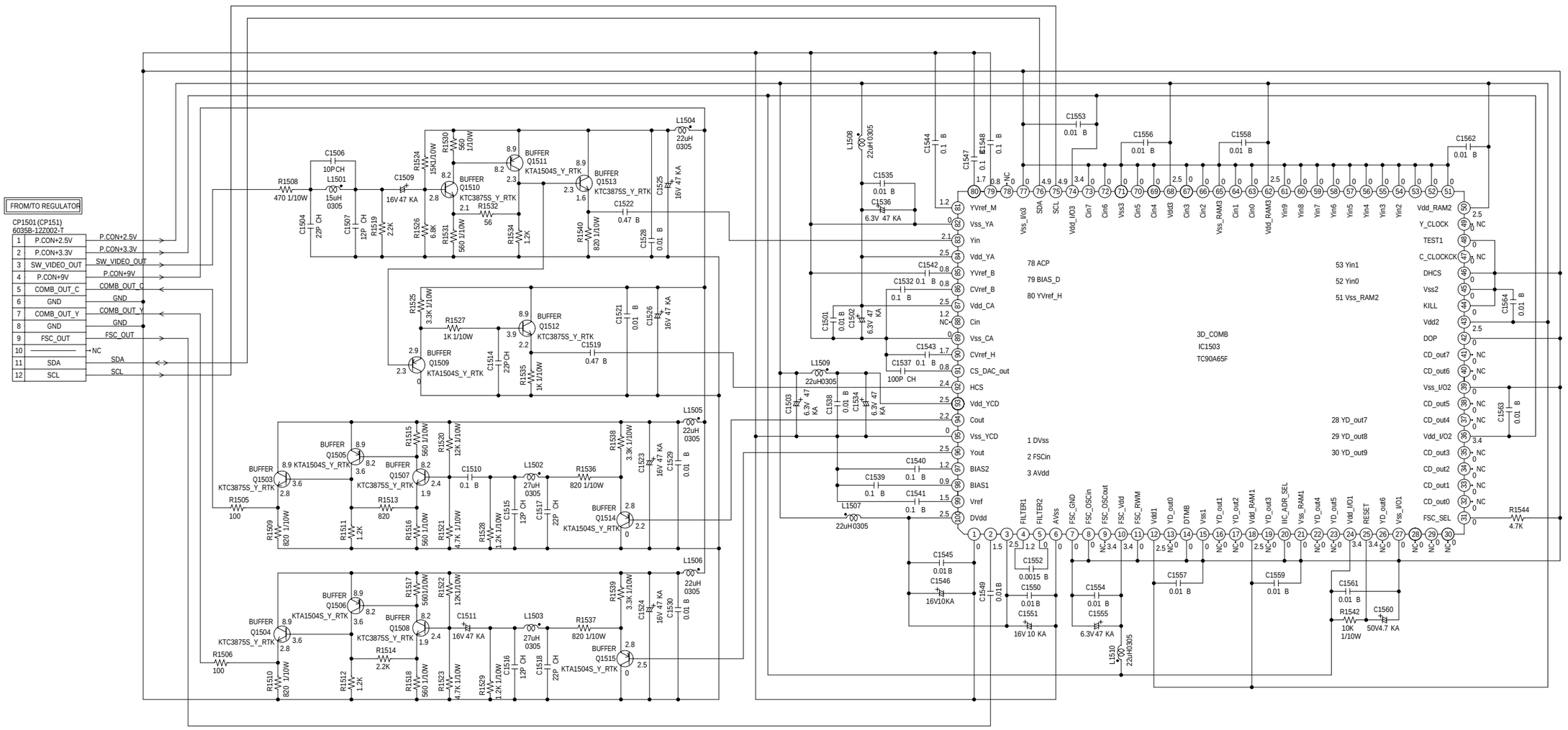
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CAUTION:SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION:LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

COMB/FILTER SCHEMATIC DIAGRAM

(COMB PCB)

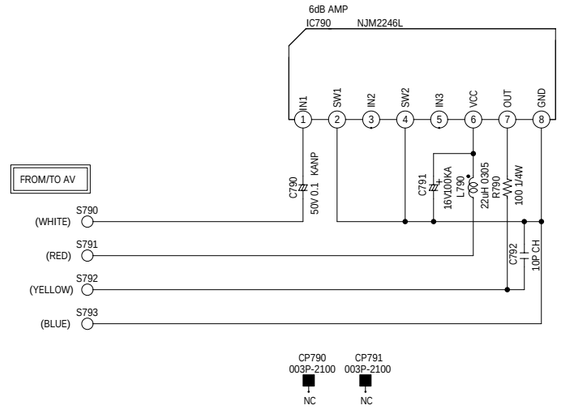


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

6DB AMP SCHEMATIC DIAGRAM

(AV PCB)



PCB250
TECB33

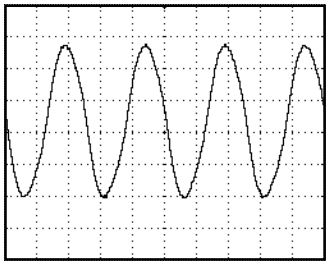
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

WAVEFORMS

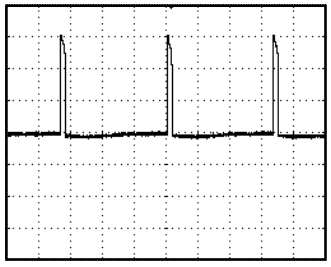
MICON

50Ns
1.0V



①

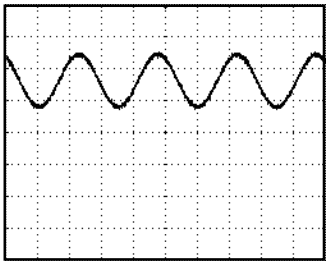
5ms
10V



⑱

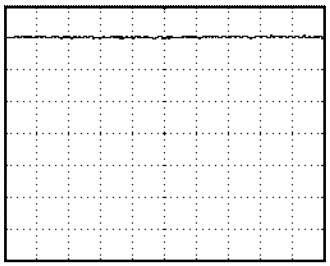
SOUND

1ms
500mV



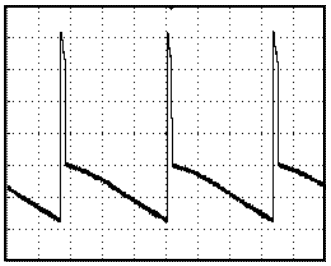
㉒

50ns
1.0V



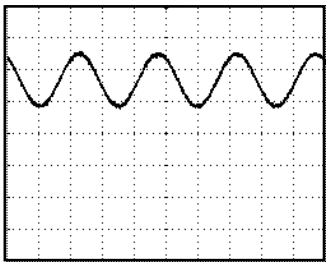
②

5ms
10V



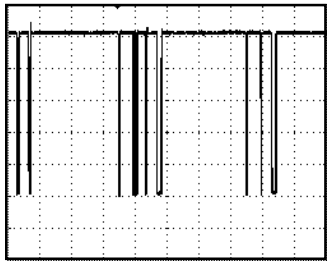
⑱

1ms
500mV



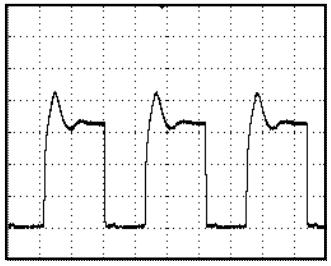
㉓

5ms
1.0V



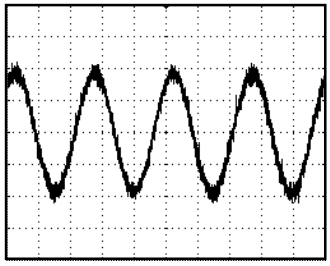
③

20µs
10V



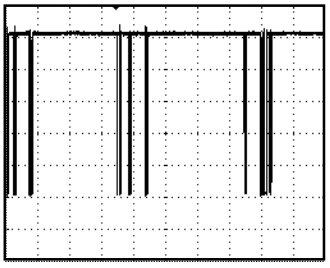
⑲

1ms
100mV



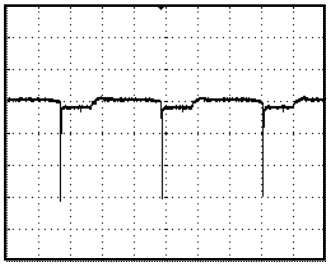
㉔

5ms
1.0V



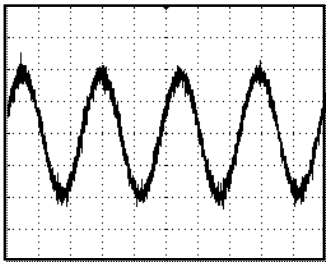
④

20µs
10V



⑳

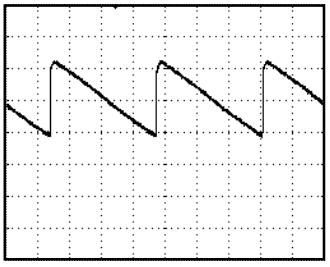
1ms
100mV



㉕

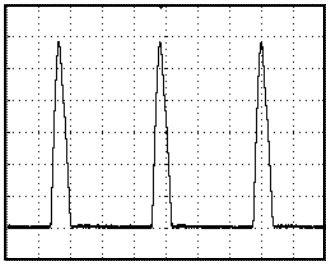
DEFLECTION

5ms
1.0V



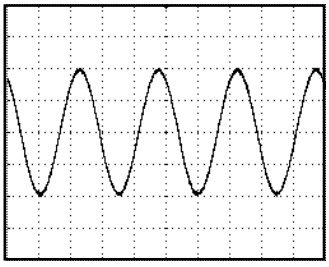
⑯

20µs
200V



㉑

1ms
2.0V

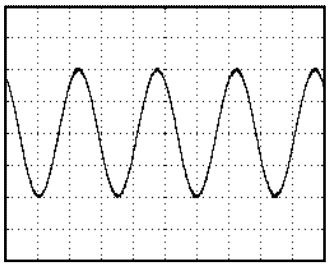


㉖

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

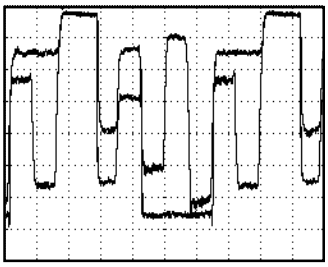
WAVEFORMS

1ms
2.0V



27

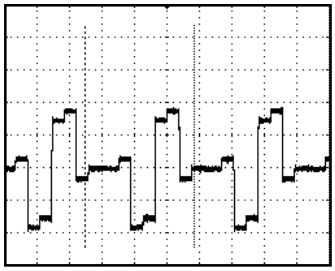
10µs
20V



39

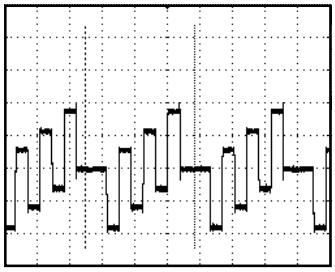
AV

20µs
200mV



28

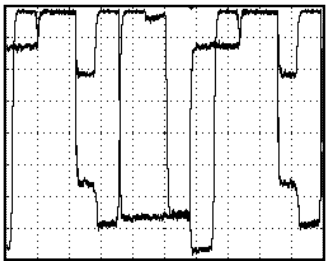
20µs
200mV



29

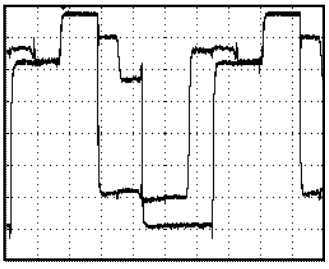
CRT/SVM

10µs
20V



37

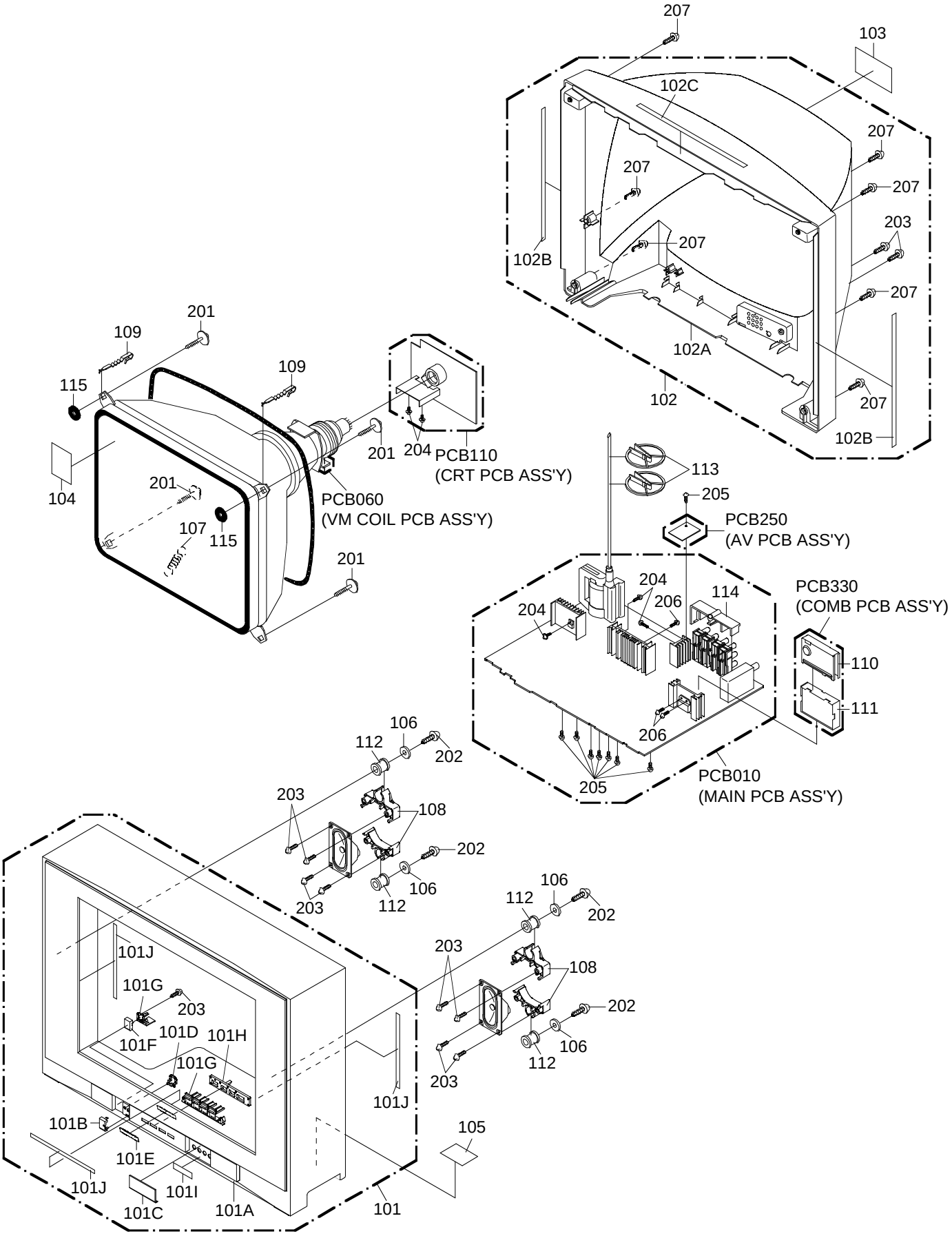
10µs
20V



38

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE001141	A3N102B720	CABINET,FRONT ASSY	
101A	AD302377	701WPJ1214	CABINET,FRONT	
101B	AD302318	711WPA0189	PLATE,FRONT	
101C	AD302378	712WPB0151	DOOR	
101D	AD302320	713WPA0279	GLASS,LED	
101E	AD302321	7235490037	BADGE,BRAND	
101F	AE001142	735WPJ0236	BUTTON,POWER	
101G	AD302380	735WPB0268	BUTTON,FRAME	
101H	AD302324	735WPA0755	STOPPER,BUTTON	
101I	AE001143	7230007679	AV LABEL	
101J	AE000723	800WQ0A008	FELT SHEET	
102	AE001144	A3N102B740	CABINET,BACK ASSY	
102A	AE001106	702WPA0994	CABINET,BACK	
102B	AD301894	800WQ0A020	FELT SHEET	
102C	AD301895	800WQ00055	FELT SHEET	
103	AE001145	7225490121	SHEET,RATING	
104	AE001146	7235490040	FILM,DECORATION	
105	AD301624	724000A002	SHEET,CSA	
106	AD300519	82A40B0104	FLAT WASHER	
107	AD300759	741WUA0021	SPRING,EARTH	
108	AD302310	761WPA0279	HOLDER,SPEAKER	
109	BZ710259	762WPA0011	HOLDER,CRT WIRE	
110	BZ710722	752WSAA014	IF SHIELD CASE	
111	BZ710723	752WSA0033	IF SHIELD BOTTOM	
112	AD300518	801WR00001	DAMPER,SPEAKER	
113	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
114	AD301616	761WPA0263	HOLDER,JACK	
115	AE001107	800WR0A026	SHEET,CRT SUPPORT (D)	
201	AD302384	8141H60D54	SCREW,TAP TITE(P) GW22	6x45
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
204	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
205	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
206	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
207	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
---	AD300432	791WHA0092	LAMIFILM,BAG	
---	AD302385	792WHA0460	PACKAGE,TOP	
---	AD302386	792WHA0461	PACKAGE,BOTTOM	
---	AD302387	793WCD1493	GIFT BOX	
---	AE000232	795WCA0665	PAD	378x1114
---	AD302388	A3N102N975	INSTRUCTION BOOK KIT	
---	AD300022	J3I70417	REGISTRATION CARD	
---	AD300023	J3I70436	ESP CARD	
---	AD302389	J3N10201A	INSTRUCTION BOOK	
---	AD301213	JA4UD300	POLYBAG,INSTRUCTION(RED CAUTION)	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
		RESISTORS			
⚠R410	AD300783	R3X181221J	R,METAL OXIDE	220 OHM 1W	
⚠R416	BZ210053	R002T22R2J	RC	2.2 OHM 1/2W	
⚠R420	AD301345	R002T22R7J	RC	2.7 OHM 1/2W	
⚠R426	AE000913	R4X5T6682F	R,METAL	6.8K OHM 1/6W	
R434	AE000914	R5X2CF2R2J	R,CEMENT	2.2 OHM 10W	
⚠R436	AD301594	R4X5T6473F	R,METAL	47K OHM 1/6W	
⚠R438	BZ210079	R6558A4R7J	R,FUSE	4.7 OHM 2W	
⚠R439	AE000676	R3K181102J	R,METAL	1K OHM 1W	
⚠R444	AD302347	R3X181120J	R,METAL OXIDE	12 OHM 1W	
⚠R445	AD302347	R3X181120J	R,METAL OXIDE	12 OHM 1W	
⚠R452	AD302348	R3X18A102J	R,METAL OXIDE	1K OHM 2W	
⚠R455	AD302349	R65582101J	R,FUSE	100 OHM 1/2W	
⚠R459	AD301595	R65582010J	R,FUSE	1 OHM 1/2W	
⚠R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W	
⚠R501	AD300035	R5X2CE010J	R,CEMENT	1 OHM 7W	
⚠R502	AD301016	R3X28A331J	R,METAL OXIDE	330 OHM 2W	
⚠R503	AD302351	R3X181R56J	R,METAL OXIDE	0.56 OHM 1W	
⚠R506	BZ210166	R002T4562J	RC	5.6K OHM 1/4W	
⚠R517	AD301973	R3X28BR22J	R,METAL	0.22 OHM 3W	
⚠R520	BZ210206	R002T2155J	RC	1.5M OHM 1/2W	
⚠R527	BZ210149	R3X18AR68J	R,METAL OXIDE	0.68 OHM 2W	
⚠R541	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W	
⚠R542	AD302351	R3X181R56J	R,METAL OXIDE	0.56 OHM 1W	
⚠R602	AD302352	R3X28B150J	R,METAL OXIDE	15 OHM 3W	
⚠R643	BZ210028	R3X28B6R8J	R,METAL OXIDE	6.8 OHM 3W	
⚠R644	BZ210028	R3X28B6R8J	R,METAL OXIDE	6.8 OHM 3W	
R740	AE000912	R002T4390J	RC	39 OHM 1/4W	
R741	AE000912	R002T4390J	RC	39 OHM 1/4W	
R742	AE000912	R002T4390J	RC	39 OHM 1/4W	
R747	AE000912	R002T4390J	RC	39 OHM 1/4W	
R748	AE000912	R002T4390J	RC	39 OHM 1/4W	
R749	BZ210119	R002T4102J	RC	1K OHM 1/4W	
R750	BZ210119	R002T4102J	RC	1K OHM 1/4W	
R751	BZ210119	R002T4102J	RC	1K OHM 1/4W	
R752	BZ210119	R002T4102J	RC	1K OHM 1/4W	
R753	BZ210119	R002T4102J	RC	1K OHM 1/4W	
⚠R804	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
⚠R806	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
⚠R808	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W	
⚠R855	BZ210185	R65582151J	R,FUSE	150 OHM 1/2W	
⚠R881	AD300417	R3X18A560J	R,METAL OXIDE	56 OHM 2W	
		CAPACITORS			
⚠C408	BZ210176	E02LF3222M	CE	2200 UF 25V	
⚠C412	AE000911	P4N8FK222H	CMPP	0.0022UF 1.5KV	
⚠C413	AD300066	E02LF4222M	CE	2200 UF 35V	
⚠C418	AE000910	P4J7F3404J	CMPP	0.4 UF 250V PMS	
⚠C420	AD301978	P4N8FJ133H	CMPP	0.013 UF 1.25KV	
⚠C421	AD300048	P3N1F5183J	CPP	0.018 UF 630V	
C425	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R	or
	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
⚠C426	BZ110204	E0ELFD220M	CE	22 UF 250V	
⚠C430	BZ110195	E02LU8220M	CE	22 UF 100V	
C442	AD301601	E53FF56R8M	CE	6.8 UF 50V NP	
⚠C501	AD300066	E02LF4222M	CE	2200 UF 35V	
⚠C502	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R	or
	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
⚠C503	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R	or
	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
⚠C504	AD301348	E02LU5100M	CE	10 UF 50V	
⚠C505	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL	
⚠C506	BZ110035	P2122B104M	CMP	0.1 UF 275V ECQUL	
⚠C507	AE000700	E52DHC681M	CE	680 UF 200V	or
	AE000142	E52DHC681S	CE	680 UF 200V	
⚠C508	AD301108	CD39E0MH3M	CC	0.0022UF 250V	
⚠C513	AD301026	CD39E0M13M	CC	0.001 UF 250V	
C517	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R	
⚠C519	AD301026	CD39E0M13M	CC	0.001 UF 250V	
⚠C521	AD301025	E62NFB221M	CE	220 UF 160V	
⚠C527	AD300925	E02LT2102M	CE	1000 UF 16V	
C535	BZ110191	C03L0R7E3K	CC	0.0015UF 2KV R	
C537	BZ110076	E02LF1222M	CE	2200 UF 10V	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		CAPACITORS		
C808	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B
C1003	AD300067	E02LF4102M	CE	1000 UF 35V
C1004	BZ110053	E02LF3102M	CE	1000 UF 25V
C1009	BZ110053	E02LF3102M	CE	1000 UF 25V
		DIODES		
D001	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D102	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D103	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D104	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D105	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D106	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
D107	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D108	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D109	BZ410054	0021721150	LED	SLR-342VCT32
D111	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D401	AD300670	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D402	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D403	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D404	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
⚠D405	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D406	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠D407	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D408	AD302110	D2CF0715L0	DIODE,SILICON	ERD07-15L50
⚠D409	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D410	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
⚠D411	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D412	AD300670	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D413	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D414	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D415	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D416	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D417	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D418	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D501	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D502	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D503	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D504	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D505	AD300076	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
⚠D506	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D507	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D508	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D509	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D510	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
⚠D511	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D513	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D514	BZ410061	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D515	BZ410008	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D517	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D518	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
⚠D519	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D520	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D522	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D523	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D524	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D525	BZ410064	D97U03R91B	DIODE,ZENER	MTZJ3.9B T-77
D526	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D527	BZ410067	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D529	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D531	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D532	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D533	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D604	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D605	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D606	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D607	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D608	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		DIODES		
D701	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D702	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D703	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D704	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D705	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D706	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D709	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D710	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D804	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D805	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D806	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D807	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D808	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D809	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D852	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D853	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D854	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D855	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D856	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D857	BZ410011	D28TELS2N2	DIODE,RECTIFER	10ELS2N-TA1B2
D858	BZ410011	D28TELS2N2	DIODE,RECTIFER	10ELS2N-TA1B2
		ICS		
IC101	AD302354	I56F07092A	IC	OEC7092A
IC199	AE000907	A3N102A015	IC	S-24C16AFJA-TB-01
IC301	AD300055	I0QF021500	IC	NJM2150AM
IC302	AD301983	I01FF58910	IC	AN5891SA-E1V
⚠IC401	AD300414	I03TD80410	IC	LA78041
⚠IC402	AD302356	I03S065100	IC	LA6510
⚠IC501	AD301770	I07E00358F	IC	BA10358F-E2
⚠IC504	AD301771	000220001W	PHOTO COUPLER	PS2561L1-1-V(W)
IC601	AD301984	I06FC12830	IC	M61283FP
IC701	AD302357	I01F058530	IC	AN15853A-E1
IC790	AE000909	I0QS02246L	IC	NJM2246L
IC902	AD300059	I01FF58290	IC	AN5829S
⚠IC1001	AD300056	I0FSP52760	IC	AN5276
IC1503	AD302358	I55FE0A650	IC	TC90A65F
		TRANSISTORS		
Q101	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q103	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q401	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q402	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT
⚠Q405	AD302136	TD50026380	TRANSISTOR,SILICON	2SD2638
Q408	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q409	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q410	AD300027	TC30041590	TRANSISTOR,SILICON	2SC4159(D,E)
⚠Q502	BZ510098	T220033260	FET	2SK3326(2)
⚠Q503	BZ510005	TA3T1371A0	TRANSISTOR,SILICON	2SA1371(D,E)-AE
Q504	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠Q505	BZ510011	TC3T029090	TRANSISTOR,SILICON	2SC2909(S,T)-AA
Q506	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
⚠Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠Q508	AD300611	TAAT01273Y	TRANSISTOR,SILICON	KTA1273_Y
⚠Q509	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q510	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
⚠Q511	AD300611	TAAT01273Y	TRANSISTOR,SILICON	KTA1273_Y
⚠Q512	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
⚠Q514	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q515	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
⚠Q516	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q517	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q518	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q519	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q601	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q602	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q603	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q604	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q605	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q606	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		TRANSISTORS		
Q607	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q608	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q611	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q701	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q702	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q703	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q709	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q711	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q712	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
⚠Q801	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q802	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q803	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q810	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q811	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q812	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
Q852	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q853	AD300024	TCUT00752Y	TRANSISTOR,SILICON	2SC752(G)(TM)_Y
Q854	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q855	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q856	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q857	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q858	AD300029	TAU0018370	TRANSISTOR,SILICON	2SA1837
Q859	AD300025	TCU0047930	TRANSISTOR,SILICON	2SC4793
Q901	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q902	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1001	BZ510068	TNAAJ05003	COMPOUND TRANSISTOR	KRC111SRTK
Q1503	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1504	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1505	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1506	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1507	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1508	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1509	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1510	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1511	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1512	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1513	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q1514	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q1515	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
		COILS &TRANSFORMERS		
L301	BZ310039	02167F220J	COIL	22 UH
L401	AD302359	02ER000001	COIL	ER000001
L402	AD300400	022100034A	COIL,LINEARITY	ELH5L4132N
L403	AD301606	02DK000058	COIL,CHOKE	02DK000058
⚠L501	AD301124	029T000101	COIL,LINE FILTER	2R2A752F28Y
L503	AD302360	028R270012	COIL,DEGAUSS	8R270012
L601	AD301989	0216A6330J	COIL	33 UH
L701	BZ310040	02167F470J	COIL	47 UH
L702	BZ310040	02167F470J	COIL	47 UH
L790	BZ310039	02167F220J	COIL	22 UH
L802	AD300123	021673151K	COIL	150 UH
L803	AD300123	021673151K	COIL	150 UH
L804	AD300123	021673151K	COIL	150 UH
L901	BZ310039	02167F220J	COIL	22 UH
L1501	AD300613	02167F150J	COIL	15 UH
L1502	AD302362	02167F270J	COIL	27 UH
L1503	AD302362	02167F270J	COIL	27 UH
L1504	BZ310039	02167F220J	COIL	22 UH
L1505	BZ310039	02167F220J	COIL	22 UH
L1506	BZ310039	02167F220J	COIL	22 UH
L1507	BZ310039	02167F220J	COIL	22 UH
L1508	BZ310039	02167F220J	COIL	22 UH
L1509	BZ310039	02167F220J	COIL	22 UH
L1510	BZ310039	02167F220J	COIL	22 UH
T401	AD301125	0450190161	TRANS,HORIZONTAL DRIVE	ETH19Y203AY
⚠T501	AD302363	048140068S	TRANSFORMER,SWITCHING	8140068S
		JACKS		
J701	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
J702	AD300108	063Q700002	JACK	YKF51-5503
J703	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
J704	AD301037	060J411024	RCA JACK	MSP-213V1-652 PBSN

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		JACKS			
J705	AD300110	060G401047	RCA JACK	HTJ-032-03AY	
J706	AD300111	060G401046	RCA JACK	HTJ-032-03AW	
J707	AD300112	060G401039	RCA JACK	HTJ-032-03AR	
J708	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN	
J709	AD300108	063Q700002	JACK	YKF51-5503	
⚠J801	BZ614115	066C130017	SOCKET,CATHODE RAY TUBE	CVT3275-5101	
J1001	BZ614361	060J131015	HEADPHONE JACK	MSJ-2000	
		SWITCHES			
SW101	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW102	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW103	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW104	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW105	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
		VARIABLE RESISTORS			
VR401	BZ210108	V116313BTC	VOLUME,SEMI FIXED	EVNCYAA03B13	
VR502	BZ210101	V1163H4BTC	VOLUME,SEMI FIXED	EVNCYAA03BE4	
		P.C.BOARD ASSEMBLIES			
PCB010	AD302364	A3N102A010	PCB ASS'Y	TMC566A	
PCB060	AD302365	A3N102A060	PCB ASS'Y	TEAA93B	
PCB110	AD302366	A3N102A110	PCB ASS'Y	TCA391B	
PCB250	AE000908	A3N102A250	PCB ASS'Y	TECB33A	
PCB330	AD302367	A3N102A330	PCB ASS'Y	TECB11A	
		MISCELLANEOUS			
B401	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0	
B403	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2	
B502	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2	
B503	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B504	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B851	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B852	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B853	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
BT001	AD302369	141L003010	BATTERY,MANGAN	R6P(AR)XICI	
BT002	AD302369	141L003010	BATTERY,MANGAN	R6P(AR)XICI	
⚠CD501	AD300746	120R615901	CORD,AC BUSH	0R615901	
CD801	BZ614457	06CU253901	CORD,CONNECTOR	CU253901	
CD802	AD302370	06CU275101	CORD,CONNECTOR	CU275101	
CD803	AD300094	06CP83035A	CORD,CONNECTOR	CP83035A	
CD851	AD302371	06CU244701	CORD,CONNECTOR	CU244701	
CD852	AD301043	06CU232001	CORD,CONNECTOR	CU232001	
CP101	BZ614102	0694270139	CONNECTOR PCB SIDE	173979-7	
⚠CP401	AD300095	069X460029	CONNECTOR PCB SIDE	B06B-DVS	
CP403	BZ614365	069S120419	CONNECTOR PCB SIDE	A2502WV2-2P	
⚠CP501	BZ614176	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD	
⚠CP502	AD300687	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P	
CP507	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100	or
	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
CP508	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100	or
	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
CP790	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100	
CP791	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100	
CP803	AD301996	069S330010	CONNECTOR PCB SIDE	A2361WV2-3P	
CP804	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100	
CP852	BZ614350	069S230629	CONNECTOR PCB SIDE	A2001WV2-3P	
CD1001	AD302372	06CU14A001	CORD,CONNECTOR	CU14A001	
CP1001	AD301045	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P	
CP1501	AD302373	069J1C0260	CONNECTOR PCB SIDE	6035B-12Z002-T	
CP801A	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P	
CP801B	AD300752	069S250629	CONNECTOR PCB SIDE	A2001WV2-5P	
CP802A	AD301997	067U007029	WIRE HOLDER	B2013H02-7P	
CP802B	BZ614485	069S270629	CONNECTOR PCB SIDE	A2001WV2-7P	
CP851A	BZ614334	067U004029	WIRE HOLDER	B2013H02-4P	
CP851B	AD301998	069S240629	CONNECTOR PCB SIDE	A2001WV2-4P	
CP852B	BZ614349	067U003029	WIRE HOLDER	B2013H02-3P	
CUS011	BZ710279	800WFAA006	CUSHION A		
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD	
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		MISCELLANEOUS		
⚠F501	AD301046	081PC6R305	FUSE	51MS063L
⚠FB401	AD302315	043227012F	TRANSFORMER,FLYBACK	3227012F
FH501	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
OS101	AD301048	0773071001	REMOTE RECEIVER	RPM7138-H5
⚠RY501	AD300114	0560V20115	RELAY	ALKS321
⚠SP1001	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠SP1002	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
TM101	AD302374	07650GR010	TRANSMITTER	CT-90158
⚠TU001	AE000273	0163300005	RF UNIT	115-V-K015AR_B
⚠V801	AD302375	0985270901	CRT W/DY	A68LXZ696X04
X101	AD302002	100CT8R005	CRYSTAL	HC-49/U-S
X602	AD302003	100CT3R505	CRYSTAL	HC-49/C

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN